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NOVEMBER 1986 VOLUME 4/ISSUE 11

# A+

## Apple II/Macintosh

THE INDEPENDENT GUIDE TO APPLE COMPUTING

Apple IIGS SPECIAL REPORT

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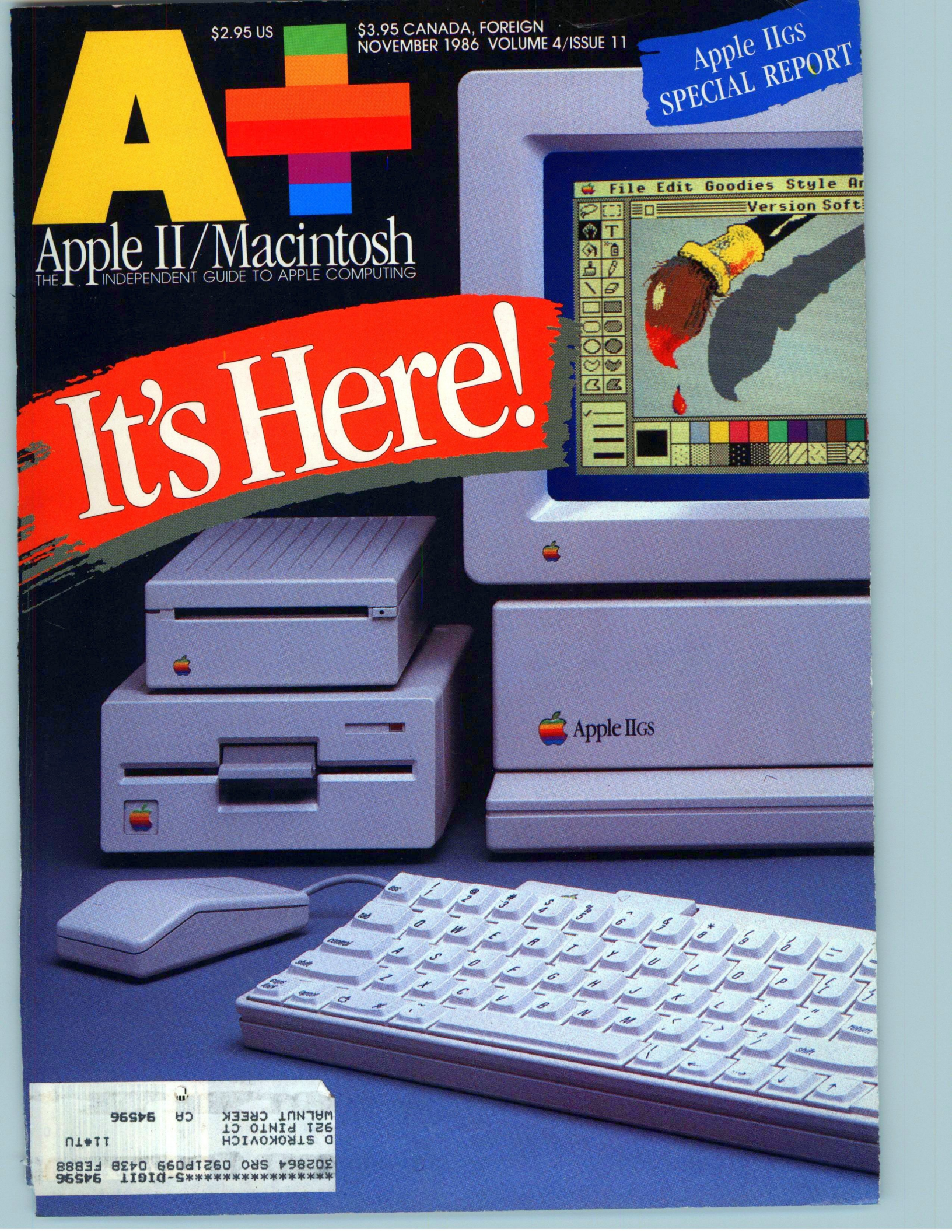


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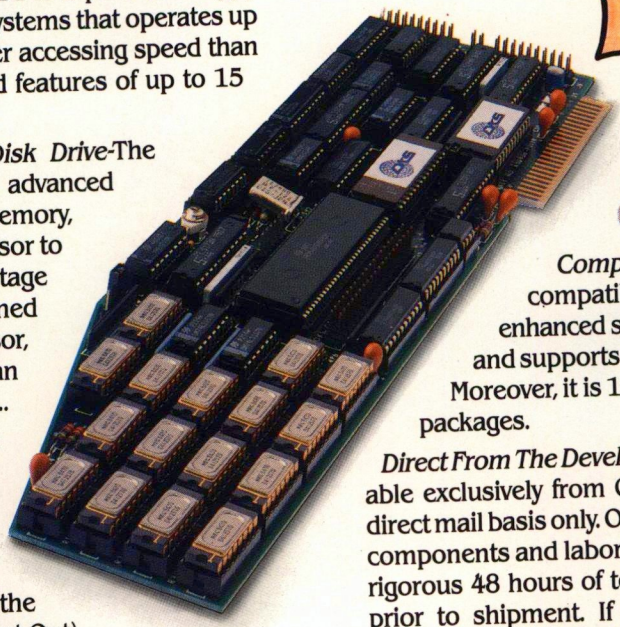

*Faster Accessing Than Hard Disk Drive*-The Kache Plus Card combines an advanced form of RAM, known as cache memory, with the power of a microprocessor to achieve a 2.5 to 1 speed advantage over hard disk accessing. Governed by a Hitachi 64180 microprocessor, the Kache Plus Card becomes an intelligent RAM disk card that...

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***AUTOMATICALLY*** saves data in RAM disk mode for future transfer to floppy disk

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*Multi-Function Features*-The Kache Plus Card also doubles as a multi-function board with a choice of up to 15 expanded features for your Apple *II* system. And, by utilizing the benefits of the Kache Plus Card's cache memory and 64180 microprocessor, each feature offers a performance advantage over comparable expansion boards on the market.

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*Standard Features:* 256K Cache Memory/RAM Disk, On Board Clock/Calendar with Battery Back-up; Utilities for Clock/Calendar; Back-up Utilities Diskette; Concurrent Operation of 2 Floppy Drives; User Friendly/Mouse Compatible Menus; On Board Firmware Utilities for Future Upgrade.

*Optional Features:* 512K Cache Memory/RAM Disk Upgrade; Expandor Module which includes: Concurrent Operation of 6 Floppy Drives, Parallel Printer Interface, 256K/512K Parallel Print Buffer, Super Serial Interface, 3 Line Serial Interface, EEPROM; External Power Supply; Cable Options which include: Duo-Disk Cable, Serial Interface Cable, Parallel Interface Cable; Replacement Battery for Clock/Calendar.

*Compatibility* - The Kache Plus Card is compatible with Apple *II*, *II+*, *IIe* and *IIe* enhanced systems with 1-6 floppy disk drives, and supports DOS, PASCAL, ProDOS and CP/M. Moreover, it is 100% compatible with all software packages.

*Direct From The Developer*-The Kache Plus Card is available exclusively from Ohio Kache Systems (OKS) on a direct mail basis only. OKS offers a full year warranty on all components and labor as well as a 30 day trial period. A rigorous 48 hours of testing is completed on each unit prior to shipment. If the Kache Plus Card does not perform as we say it will, simply return it to OKS and your money will be fully refunded.

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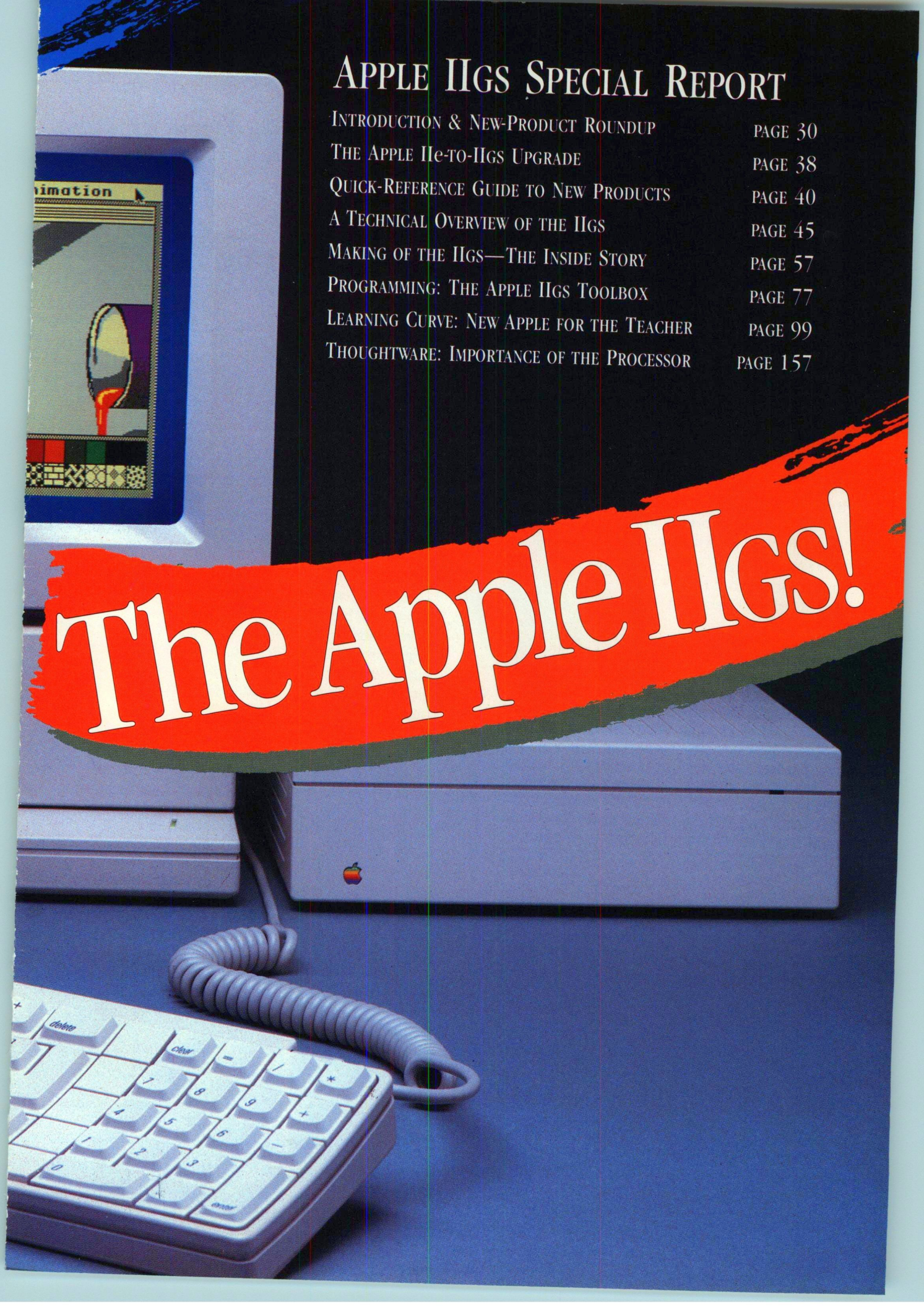

# The Apple IIGS!

## Apple IIGs Special Report


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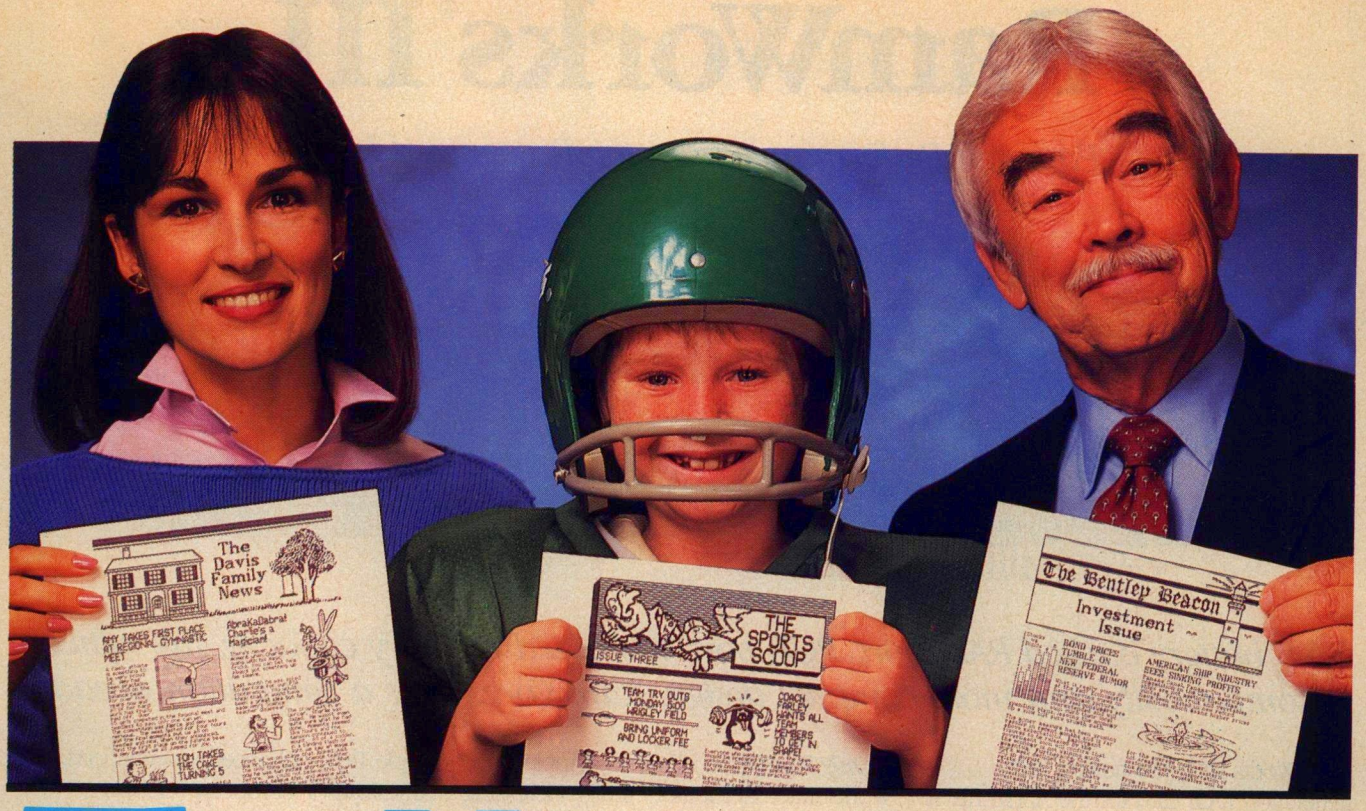


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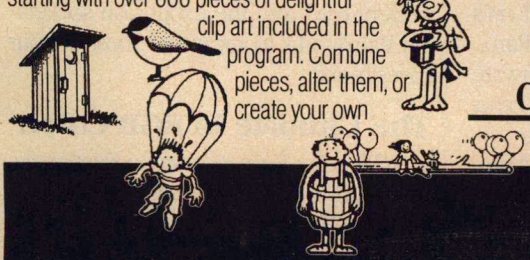

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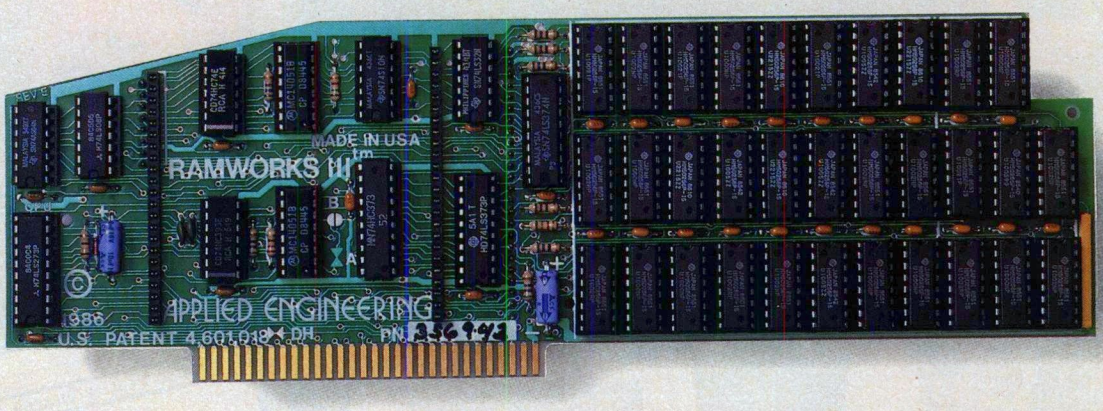



*With battery backed RAM port, RGB port, increased memory capacity, full software compatibility and more compact design, RamWorks III is a generation ahead.*

RamWorks III is the newest 3rd generation RAM card for the Apple IIe. It incorporates all of the technology and improvements that years of experience and over a hundred thousand sales have given us. By selling more memory cards than anyone else and listening to our customers, we were able to design a memory card that has the ultimate in performance, quality, compatibility and ease of use. A design so advanced it's patented. We call it RamWorks III, you'll call it awesome!

## The AppleWorks Amplifier.

While RamWorks III is recognized by all memory intensive programs, NO other expansion card comes close to offering the multitude of enhancements to AppleWorks that RamWorks III does. Naturally, you'd expect RamWorks III to expand the available desktop, after all Applied Engineering was a year ahead of everyone else *including Apple* in offering more than 55K, and we still provide the largest AppleWorks desktops available. But a larger desktop is just part of the story. Look at all the AppleWorks enhancements that even Apple's own card does not provide and *only* RamWorks III does. With a 256K or larger RamWorks III, *all* of AppleWorks (including printer routines) will automatically load itself into RAM dramatically increasing speed by eliminating the time required to access the program disk drive. Switch from word processing to spreadsheet to database at the speed of light with no wear on disk drives.

*Only* RamWorks eliminates AppleWorks' internal memory limits, increasing the maximum number of records available from 1,350 to over 25,000. *Only* RamWorks increases the number of lines permitted in the word processing mode from 2,250 to over 15,000. And *only* RamWorks offers a built-in printer buffer, so you won't have to wait for your printer to stop before returning to AppleWorks. RamWorks even expands the clipboard. And auto segments large files so they can be saved on two or more disks. You can even have Pinpoint or MacroWorks and your favorite spelling checker in RAM for instant response.

RamWorks, nothing comes close to enhancing AppleWorks so much.

## The Most Friendly, Most Compatible Card Available.

Using RamWorks III couldn't be easier because it's compatible with more off-the-shelf software than any other RAM card. Popular programs like AppleWorks, Pinpoint, Catalyst, MouseDesk, Howard-Soft, FlashCalc, Pro-Filer, Managing Your Money, SuperCalc 3a, and MagiCalc to name a few (and *all* hardware add on's like ProFile and Sider hard disks). RamWorks is even compatible with software written for Apple cards. But unlike other cards, RamWorks plugs into the IIe auxiliary slot providing our super sharp 80 column text (U.S. Patent #4601081) in a completely integrated system while leaving expansion slots 1 through 7 available for other peripheral cards.

RamWorks III is compatible with all Apple IIe's, enhanced, unenhanced, American or European versions.

## Highest Memory Expansion.

Applied Engineering has always offered the largest memory for the IIe and RamWorks III continues that tradition by expanding to 1 full MEG on the main card using standard RAMs, more than most will ever need (1 meg is about 500 pages of text)...but if you do ever need more than 1 MEG, RamWorks III has the widest selection of expander cards available. Additional 512K, 2 MEG, or 16 MEG cards just snap directly onto RamWorks III by plugging into the industry's only low profile (no slot 1 interference) fully decoded memory expansion connector. You can also choose non-volatile, power independent expanders allowing permanent storage for up to 20 years.

## It Even Corrects Mistakes.

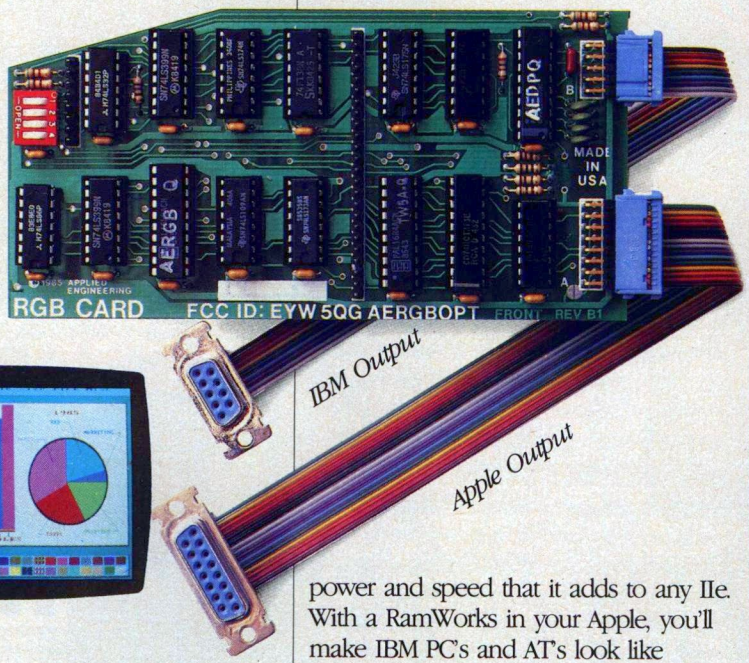
If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks III, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks to recapture most of your investment!

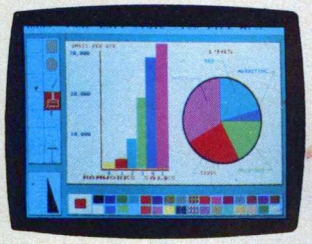
## The Ultimate in RGB Color.

RGB color is an option on RamWorks and with good reason. Some others combine RGB color output with their memory cards, but that's unfair for those who don't need RGB *and* for those that do. Because if you don't need RGB

Applied Engineering doesn't make you buy it, but if you want RGB output you're in for a nice surprise because the RamWorks RGB option offers better color graphics plus a more readable 80 column text (that blows away any composite color monitor). For only $129 it can be added to RamWorks giving you a razor sharp, vivid brilliance that most claim is the best they have ever seen. You'll also appreciate the multiple text colors (others only have green) that come standard. But the RamWorks RGB option is more than just the ultimate in color output because unlike others, it's fully compatible with all the Apple standards for RGB output control, making it more compatible with off-the-shelf software. With its FCC certified design, you can use almost any RGB monitor because only the new RamWorks RGB option provides both Apple standard and IBM standard RGB outputs (cables included). The RGB option plugs into the back of RamWorks with no slot 1 interference and remember you can order the RGB option with your RamWorks or add it on at a later date.

*RGB Option*



## True 65C816 16 Bit Power.

RamWorks III has a built-in 65C816 CPU port for direct connection to our optional 65C816 card. The only one capable of linearly addressing more than 1 meg of memory for power applications like running the Lotus 1-2-3™ compatible program, VIP Professional. Our 65C816 card does not use another slot but replaces the 65C02 yet maintains full 8 bit compatibility.

## Endorsed by the Experts.

A+ magazine said "Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks...I like the product so much that I am buying one for my own system." inCider magazine said "RamWorks is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars...For my money, Applied Engineering's RamWorks is king of the hill."

*"I wanted a memory card for my Apple that was fast, easy to use, and very compatible; so I bought RamWorks."*

*Steve Wozniak, the creator of Apple Computer*

Apple experts everywhere are impressed by RamWorks's expandability, versatility, ease of use, and the sheer power and speed that it adds to any IIe. With a RamWorks in your Apple, you'll make IBM PC's and AT's look like slowpokes.

## Quality and Support of the Industry Leader

RamWorks III is from Applied Engineering, the largest, most well supported manufacturer of Apple peripherals and the inventor of large RAM cards for the Apple. With our 5 year no hassle warranty and outstanding technical support, you're assured of the most trouble free product you can buy.

## It's Got It All

- 15 day money back guarantee
- 5 year hassle free warranty
- Built-in super sharp 80 column display, (U.S. Patent #4601081)
- Expandable to 1 MEG on main card
- Expandable to 16 meg with expander cards, with NO slot 1 interference
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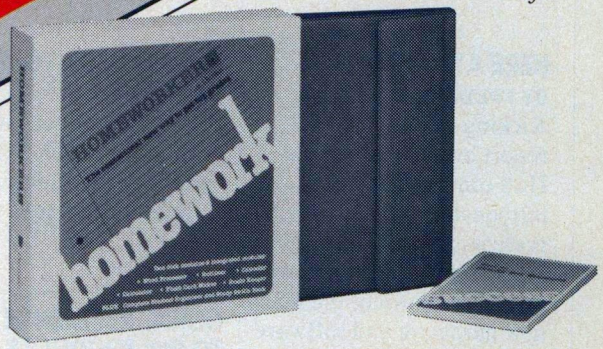


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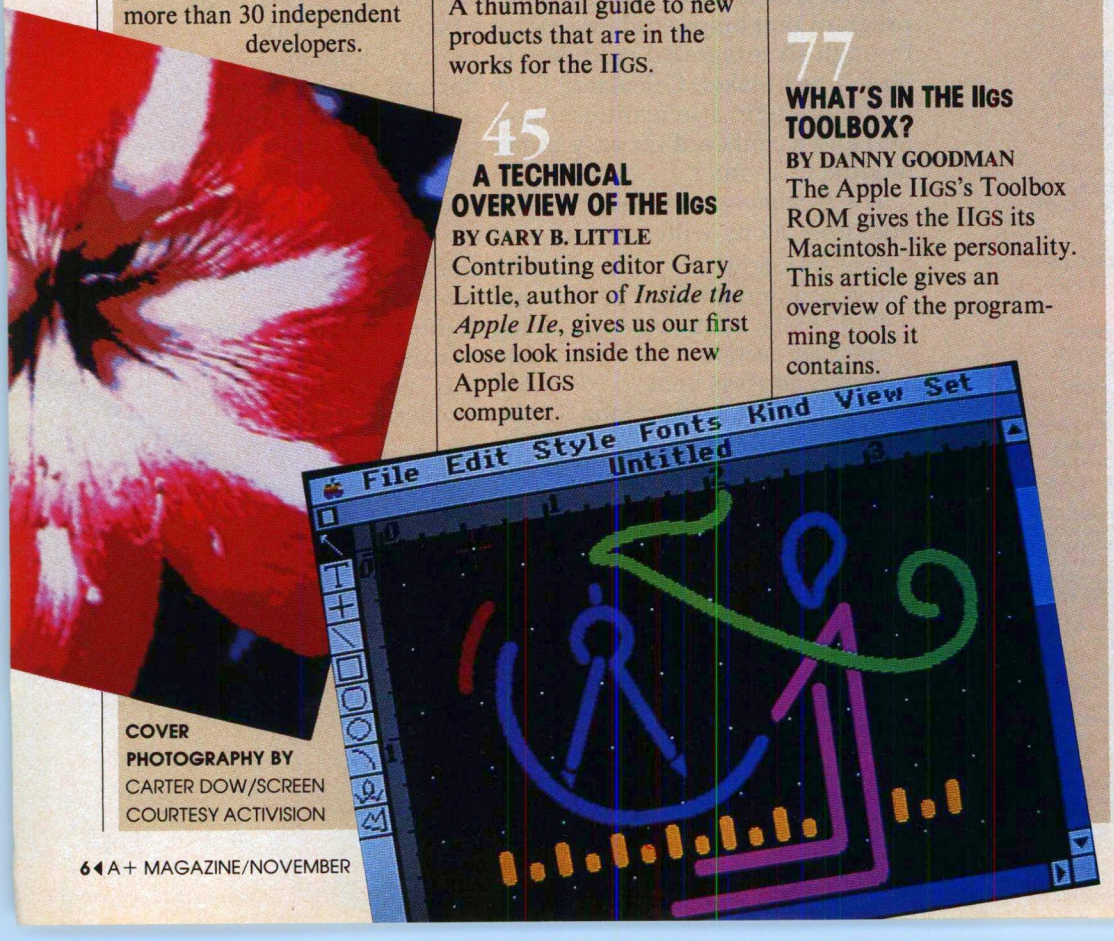


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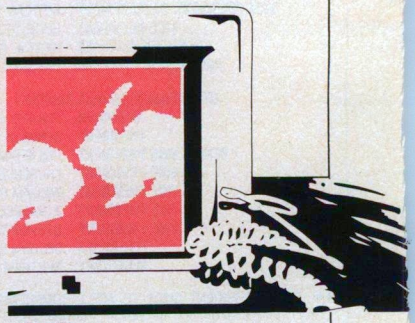


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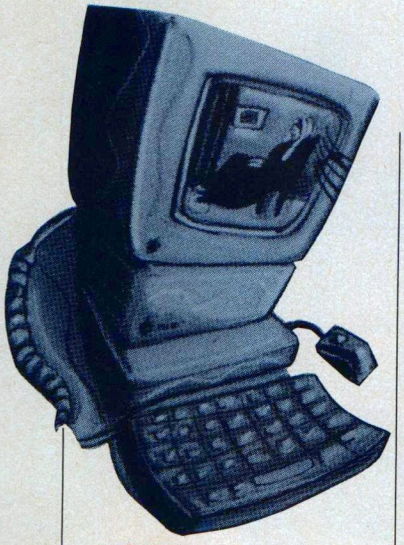


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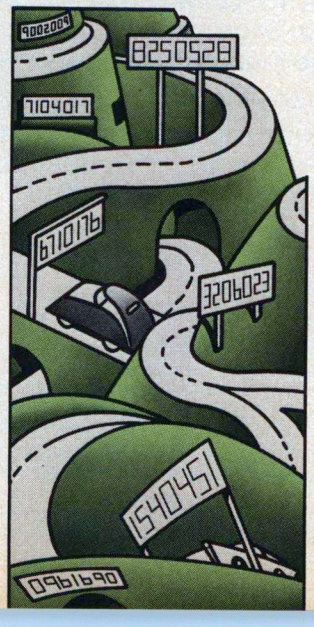


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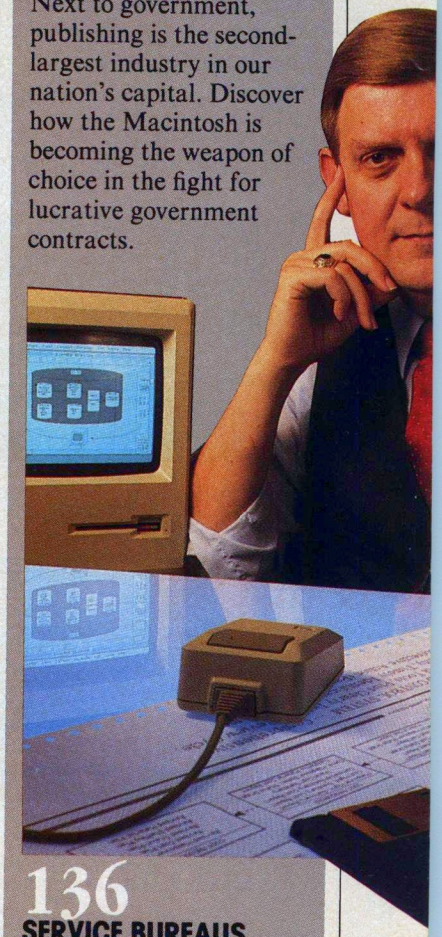


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# A FOND FAREWELL AND A NEW BEGINNING

Last month in my "NewsPlus" column, I said there would be big news in next month's issue of *A+*. I was referring to the recent introduction of the new Apple IIGS computer, which is the subject of a special report in this issue of *A+*. Little did I realize when I wrote those words, however, that another piece of important news would appear in this issue, namely that I would be taking over as the new editor in chief of this magazine. Maggie Canon, whose countenance has graced this page since the founding of *A+* in 1983, has left us to take a job as the editor of the new *San Francisco* magazine.

Maggie can lay claim to developing two major publications (first *InfoWorld*, then *A+*), and I'm sure she'll do a great job helping *San Francisco* get off the ground. Working with Maggie to help build *A+* into the world's most widely read Apple magazine has been a tremendously rewarding experience, and I'm sure I speak for the entire staff in wishing her the very best of luck in all her future endeavors.

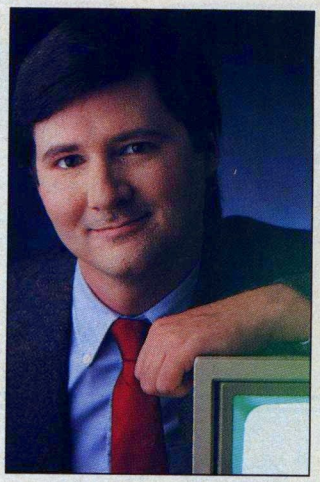
What will happen to *A+* now that I'm at the editorial helm? More great things, I assure you. Some of the changes are still under wraps, but you can expect to see *A+* keep getting better all the time. One of the first changes you'll notice is a new column called "GamePort" in our "That's Entertainment" department; we added GamePort because we think Apple users like to play hard as well as work hard. Computer games represent one of the most creative areas of high technology, and a surprisingly large body of practical computer applications has evolved from computing principles that have come from game programming. Also, look for expanded AppleWorks coverage by some of the industry's top experts. And if you'd like to make any comments about *A+*, write to me at *A+*, Letters to the Editor, 11 Davis Drive, Belmont, CA 94002.

The other big news this month is the arrival of the newest member of the Apple II family, the long-awaited Apple IIGS. The IIGS is the first new computer Apple has introduced since it announced the Macintosh in January 1984 and is the first major redesign of the Apple II since its first appearance ten years ago. The Apple II Plus, IIe, and IIc are all relatively minor variations on the original Apple II design.

Although the IIGS resembles the Macintosh in many ways, it is still definitely an Apple II; the IIGS is compatible with most Apple II software, and it cannot run Macintosh software. It does offer a substantial amount of the technology used in the Macintosh, however, such as a mouse, pull-down menus, windows, dialog boxes, and the AppleTalk network. Because of the IIGS's similarities to the Macintosh, comparisons are inevitable, and I might as well jump into the fray with my own tally of how the two computers stack up.

First, score one for the IIGS because the IIGS has color graphics and the Mac doesn't, at least for now (I suspect that when the Mac finally does get color, it will be well into next year and will cost a lot more than color on the IIGS). The only reservation I have regarding the IIGS graphics is about the computer's speed, but it's too early to tell what kind of performance programmers will be able to obtain for techniques such as animation. Also, since the Apple IIGS has expansion slots, some clever developers may find ways to speed up graphics with special add-in boards.

Now score a point in favor of the Mac because it has a speedy 68000 32-bit processor chip (the brain of the computer) and the IIGS has only a 16-bit 65816 processor chip that is sluggish in comparison to the Mac's processor chip. The 68000 chip is an important chip that many state-of-the-art computers have, whereas the 65816 chip is a bit of an oddball and has never seen use in a computer before. Apple chose to use the 65816 in its new computer since it provided compatibility with existing Apple II software, but some developers have criticized Apple for the decision to steer away from the well-known 6502



*The IIGS is the first new computer Apple has introduced since it announced the Mac in January 1984 and is the first major redesign of the Apple II.*

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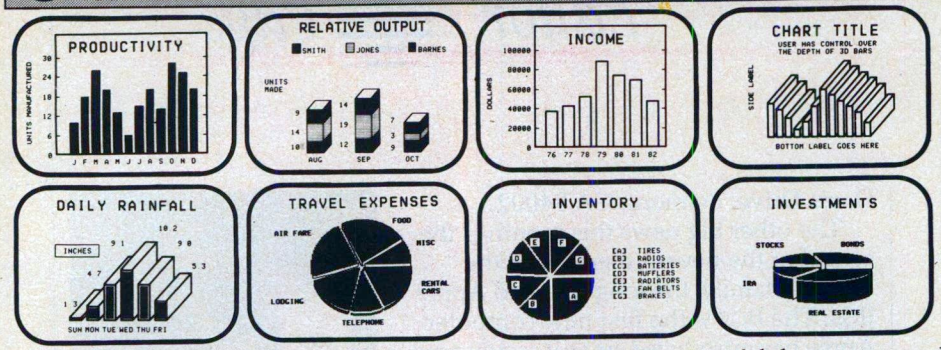


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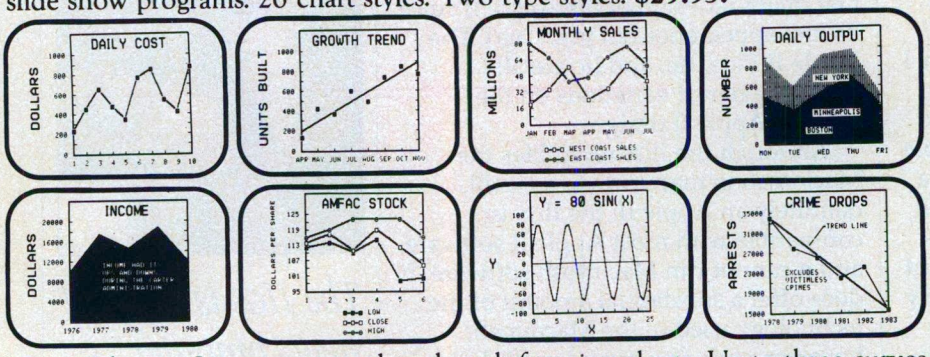


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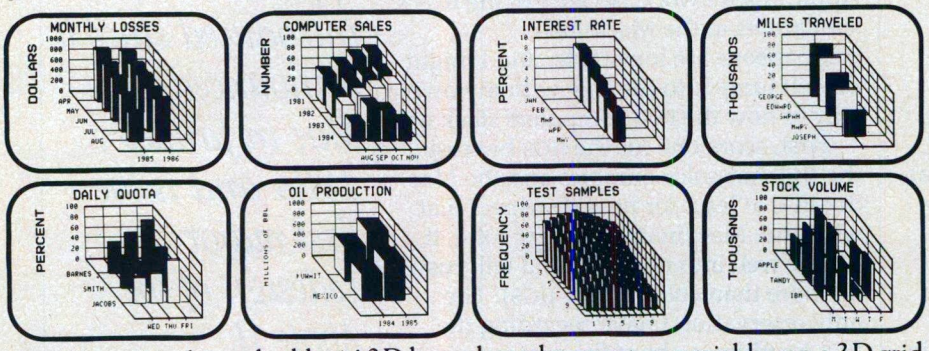


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and 68000 toward the as-yet-unproven 65816.

Next, score another point (with a trumpet fanfare, please) for the IIGS because of its great sound capabilities, which are much better than those of the Macintosh. The IIGS's impressive sound features are due to the remarkable Ensoniq sound chip. It essentially puts the heart of a $1500 Ensoniq Mirage music synthesizer inside each Apple IIGS. Although software developers will probably take a while to figure out how to tap the Ensoniq chip's capabilities, the IIGS has the distinction of having the best built-in sound capabilities of any personal computer. These abilities are not limited to music—the chip can act as a sound digitizer to store, edit, and recreate virtually any sound, including sound effects, telephone tones, and even natural-sounding spoken words in any language.

All in all, the IIGS stacks up fairly well against the Macintosh, especially as a consumer product. Opinions about the IIGS do vary, though, with two main schools of thought currently prevailing. Macintosh people are unhappy that the IIGS is not a Mac; they wish it were faster, had a 68000, and ran Mac software. Apple II people are more happy about the IIGS, because it combines the open architecture of the Apple II with the software technology of the Macintosh and still runs most of their Apple II software to boot. Apple IIe owners are the happiest, because they can upgrade their IIe to a IIGS for much less than the cost of a new system. The IIe-to-IIGS upgrade is great, except that II Plus and IIc owners are left behind. I think Apple should have offered some sort of upgrade path for these folks as well; II Plus owners should at least have been able to upgrade to a IIe.

To help you find out more about the new Apple IIGS, we've put together a special report that provides an in-depth look at Apple's new baby. I'm interested in knowing what you think of the IIGS, so drop me a line if you get a chance. I look forward to hearing from you and to working with the rest of the *A+* staff in making *A+* better than ever. ✚

Fred

FREDERIC E. DAVIS/**EDITOR IN CHIEF**

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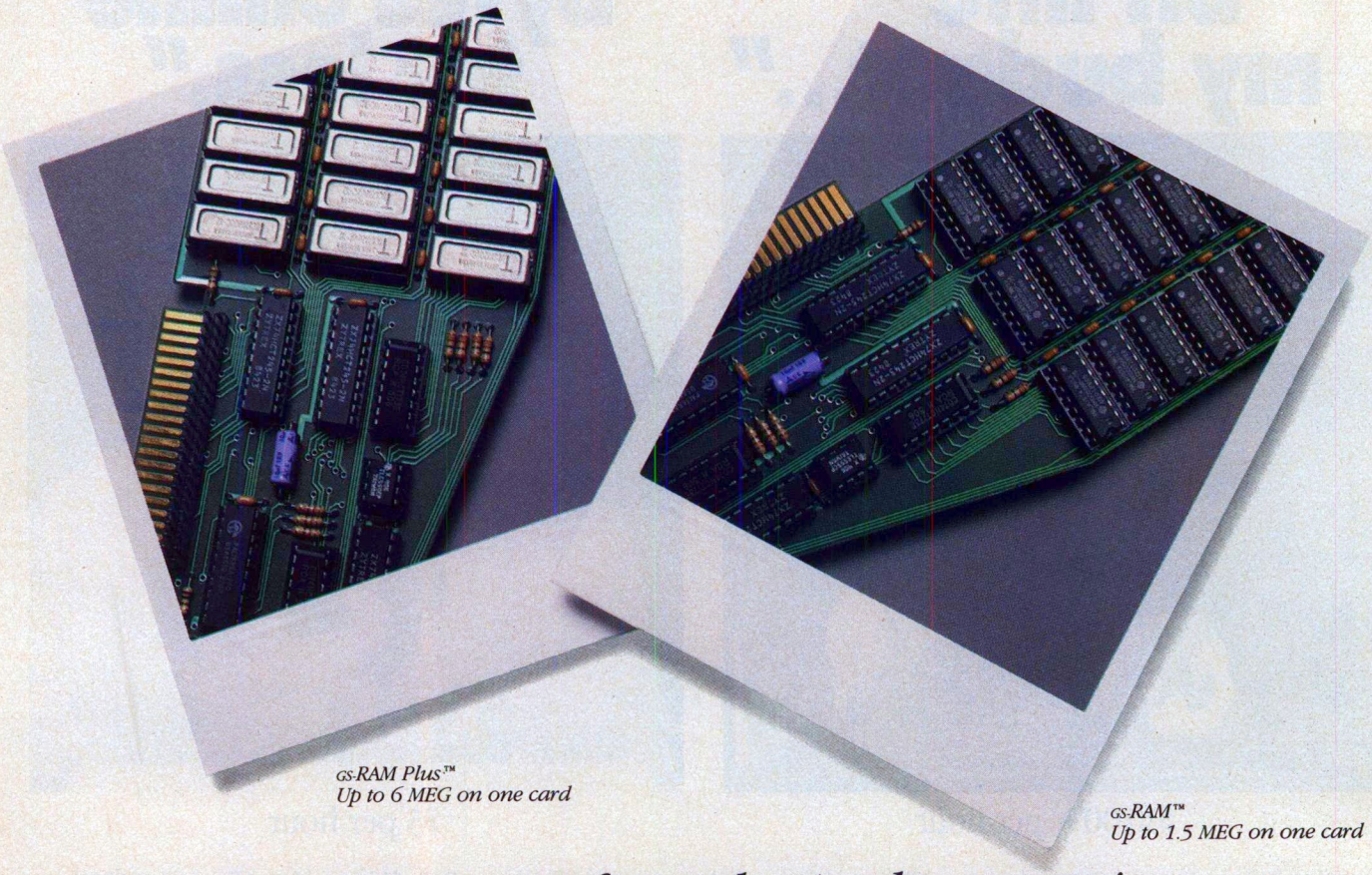

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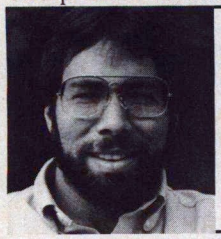

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*We invite your comments.*

# Letters

## KEEPING DRIVE HEADS CLEAN

**Dear *A+*:** I am writing in regard to the "Diskette Primer" article in the August 1986 issue. In a magazine of the quality of *A+*, comments such as "I've personally never liked them" are totally out of place when discussing "special cleaning diskettes."

It happens that many disk-drive manufacturers recommend, and even use, cleaning disks. The manufacturers of disk-certification equipment use them and are now recommending that their customers use them as well.

The author is right when he recommends that you follow the directions that come with the cleaning diskette. He is also right if you want to clean the heads yourself with a cleaning solvent and a swab. Just be sure that the swab is lint-free, contaminant-free, and antistatic. If your cleaning solvent is isopropyl alcohol (IPA), you must wipe the head clean with a fresh swab or sleeve, since IPA leaves a slight residue. This is why the wet/dry disk-drive-head cleaning systems are the best. IPA is the best cleaning solvent, and the alternating wet/dry action of the cleaning disk removes the IPA residue.

Recommendations are to clean your drives every 40 hours of work time—more often if they are in a contaminated environment. Waiting until it is necessary to do so is waiting too long. Ask anybody who's learned that way. Lost data can be replaced only through the expenditure of extra time.

Lewis J. Scheinman
TECH-SA-PORT
Pittsburgh, PA

## PRINTER-BUFFER SOLUTION

**Dear *A+*:** I would like to express my thanks for your very informative magazine, especially here in Korea, where I do not have access to Apple IIe users' groups. Many helpful articles, letters to the editor, etc., have enabled me to work out bugs in my system and use it more effectively! Now, I would like to share one of the things I have found, by putting together little bits of information from many sources and many hours of trial and error on my own, in hopes that it might relieve the frustrations of some other readers.

My system consists of an unenhanced Apple IIe, Epson Dual Disk Drive, Epson RX-80 Printer, Buffered Grappler+ printer interface with 16K buffer (later expanded to 64K), and RamWorks II (Revision B3 with 1024K). After getting the RamWorks II card and an updated AppleWorks (Version 1.2) program, I ran into the problem of erratic printing of a line or two of garbage even on documents as small as three pages. A book inventory (111K) on the AppleWorks spreadsheet produced two lines of garbage in the middle of the printing at two locations and then went back to printing normally. Subsequent printings did not reveal a consistent location of the garbage. Consultation via letter with Applied Engineering and Orange Micro did not yield a solution to the problem.

Finally, a note from a teacher in the Chattanooga Christian School in Tennessee gave me a hint. He had found that when the RamWorks II printer-buffer option was in use on his system (not the same as mine), his printer would not print. Without the printer-buffer option in effect, he had no problem. Working with this clue in mind, I found that if I reconfigured my AppleWorks start-up disk with the RamWorks II-supplied Super AppleWorks Desk Top Expander, Version 5.1.1 with the Auto-Load feature but *without* the printer-buffer option, then the garbage problem was completely eliminated.

Since I wanted to have a larger printer buffer, I added six more chips to my original Buffered Grappler+ card to expand its memory to 64K. Subsequently, I found an additional advantage over the use of the RamWorks II buffer. The RamWorks II printer buffer had taken all of my long document (111K) into the buffer easily, but while the computer was supposedly free for use in other work while the printer was at work, the speed of the computer was like molasses flowing in a January snowstorm! It took 15 minutes or more before I had speedy use of the computer again. *Now*, without the RamWorks II buffer and using the Buffered Grappler+ printer-interface card with a 64K printer buffer to print the 111K document, I am able to get full use of the computer back in a matter of a few minutes. With a more-normal document length of 10–20K, I can get immediate use of the computer back and go on to other work while the printer churns away.

Robert L. Goette
Taejon, Korea

## YOKING AROUND WITH FLIGHT SIMULATOR

**Dear *A+*:** I share Donald Oliver's enthusiasm for Flight Simulator II (August 1986). I learned to fly a full-size Cessna and made one flight on my spanking-new license. Unfortunately, rental costs were so high I couldn't afford to keep my skills current and safe. Flight Simulator II brings back the old thrills, and I get a

real gut-wrenching shock when CRASH appears on the screen.

I have built a yoke similar to the real thing to attach to my Apple IIc. It replaces the joystick and brings more realism to the program. The yoke eliminates a lot of problems coordinating the elevator and ailerons, and it gives me a free hand for the flap and throttle keys.

Any interested readers who are able to use a few woodworking tools and a soldering iron are welcome to write for information about the IIc Simulator Yoke plans.

Bill Pearson
31 Falshire Terrace NE
Calgary AB Canada T3J 2G5

## RAINBOW PRINTING

**Dear *A+*:** I am writing to express appreciation for the "Speaking of Graphics" column in the July issue, which included a look at Springboard's Rainbow Painter.

I do want to point out one thing that was mentioned in error. Rainbow Painter does not allow users to print out copies of the pictures they have created. Although this is not a major error, we have received a few calls from customers asking why their version does not have this feature, so I thought I should notify you.

Kathy Quinby
Marketing Coordinator
Springboard Software, Inc.
Minneapolis, MN

## ONE SCHOOL'S SOLUTION

**Dear *A+*:** Regarding your May editorial on software piracy and some of the self-righteous attitudes of teachers indulging in it, I'd like to tell you how one school solved the problem of providing enough copies of Instant Pascal for the 22 Apple IIe's in our computer lab, without resorting to blatant piracy.

As teachers we felt a responsibility to practice what we preached ("no pirating using *our* machines") and to set an example for the students.

We bought 12 complete Instant Pascal packages (at a discount from Apple.) Each student was required to pay a $10 lab fee (we figure that in three years we'll get our money back). Each package included a two-sided master disk to run Instant Pascal and a *backup copy*—so now we had 24 copy-protected disks (one for each machine and 2 for teachers to use at home or wherever).

We also received 12 tutorial disks and 12 disks of sample programs, which were not copy-protected, so we made 12 more copies of each for teacher and lab use. Also included were 12 copies of the Addison-Wesley text for the course, which we kept for teacher use and *temporary* loan to students for use during the lab period; each student was expected to buy a copy from the school bookstore for personal use outside of the lab period. The 12 quick-reference booklets were shared, 1 for every two computers and 1 for teacher use.

All of the disks were numbered, 1 through 22 and M for master, T for tutorial, and S for sample programs. At the beginning of each teacher-supervised lab period, every student signed for the disks needed, using the number that corresponded to his or her assigned computer. They were all checked back in at the end of the period—simplicity itself, until we got to the lesson about how to initialize a student disk.

Unbelievable as it seemed to us, the master disks all had open notches on side 2, which allowed five of the less-alert students to initialize side 2 of their master disks instead of initia-


# Infocom introduces four new gam

Infocom,™ the crazy people who brought you "Zork"® and "The Hitchhiker's Guide to the Galaxy,"™ has a habit of coming up with games that add a new dimension to interactive fiction. And the best keeps getting better. Case in point: "Leather Goddesses of Phobos."™ It has a scratch n' sniff card and a 3-d comic book to excite all your senses. Once your interest is piqued, you'll embark on a rowdy romp through the solar system. This hilarious spoof of 1930's pulp science fiction has 3 "naughtiness levels," for the prude to the lewd. "Leather Goddesses" is sure to amuse members of either sex.

### One's really warped.

Then there's "Trinity."™ It answers the question of whether a game can be both light-hearted and profound. You journey through a time warp into a mischievous fantasy world where all atomic explosions are mysteriously connected. "Trinity" takes you back to the dawn of the atomic age and puts the course of history in your hands.

### One's a real circus.

It has been said that the circus is the only really mysterious thing left in civilization. One thing's for sure, there is plenty of mystery in "Ballyhoo."™ While trying to locate the circus owner's kidnapped daughter, you are somersaulted into a three-ring world of deception and crime. To solve the crime

lizing a student disk.

We shipped the five affected disks back to Apple with a cover letter explaining what had happened and asked them to restore them to their original condition. In due time, we got them back, *unchanged*, with a letter suggesting we contact our local Apple dealer.

Meanwhile (after sticking little silver patches over all the open notches), we had been getting along in the lab by using the two teacher master disks and asking some of the students to come back during an open lab period later in the day instead of during their scheduled lab period.

Fortunately, about this time one of the teachers got an update to her copy program that enabled her to copy the protected master disk, and then eventually we received our original disks, properly restored, after we had asked the local Apple dealer to explain things to The Big Apple in Cupertino on our behalf.

The rest of the semester rolled along smoothly. We keep tight control over our disks and have the comfortable feeling that we won't have to go out of business temporarily if some mass disk malaise should strike us in the future, thanks to our ability to copy for ourselves. Yet we have paid for what we are using and have steadfastly refused to allow any student to borrow a master disk for use on a computer at home.

While I'm on the subject of *educational software* and pirating: Why not ask more educational and philanthropic organizations to provide the money to hire teachers and professional programmers to work together to develop some good educational software, perhaps even new languages and operating systems, *and then put them into the public domain*, instead of having private businesses hiring the teachers and professional programmers and then expecting the school systems to pay them a royalty for using their products and getting into this copy-protection and pirating hassle in the first place?

Wells Lawrence
Honolulu, HI

## BUSINESSWORKS OPTIONS

**Dear *A+*:** We at Manzanita were delighted to read your September issue article on accounting. I wonder how many people noticed that BusinessWorks was the product running on the Apple IIe on the cover?

I felt the article was well researched and well written. I did want to point out one omission, however. The system requirements state that BusinessWorks runs on two 3.5-inch drives or one 3.5-inch drive and a RAM card or hard-disk drive. This information is correct, but BusinessWorks 5.10 can also be installed on a hard-disk drive, supplemented by one 5¼-inch drive. BusinessWorks is shipped with both, so that customers can use it regardless of the type of equipment they own.

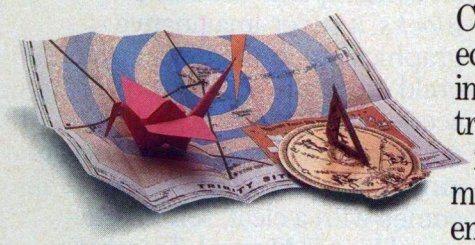
Joan L. Levers, Director
Corporate Communications
Manzanita Software Systems
Roseville, CA

## CORRECTIONS

Our August 1986 issue's "Pipeline" section (page 110, columns 3 and 4), incorrectly refers to a company as Erez Ansel. The actual name of the firm is Erez Anzel.

Our September "Pipeline" (page 117) included a product called myDiskLabeler from Williams & Macias Microcomputer Products. The correct phone number of the firm is (800) 752-4400.


# es. One really smells.



*Every package includes an integral set of props to excite your senses and enhance the game.*

and save your hide from a permanent spot in the freak show, you'll need to stretch your puzzle-solving skills to the limit.

**One's really haunting.**

Wrapping up this new quartet is a classic gothic mystery set in a haunted castle on the mist-shrouded seacoast of Cornwall. In "Moonmist"™ you'll explore the darkest reaches of Tresyllian Castle and get involved with an eccentric cast of characters, including British nobility, while trying to save your best friend from a vengeful ghost. "Moonmist" offers four distinctly different sets of clues, problems, solutions and hidden treasures. So you'll die to replay it again and again.

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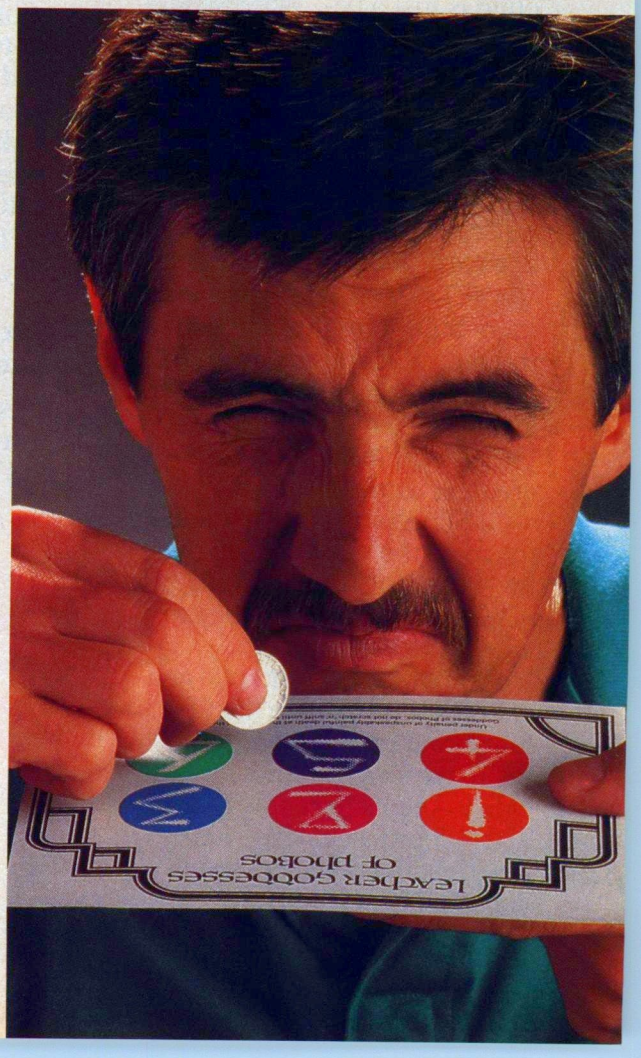
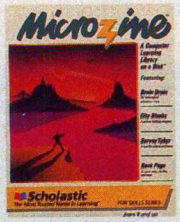



CIRCLE 225 ON READER SERVICE CARD

# It's not only the most popular educational software in America. It's also the most affordable.

## MICROZINE. The computer learning library with *four* great programs on every disk. Try it *free* and find out why it won the "Best Micro-computer Software of the Year" award.

**Explore MICROZINE free in your own home—with no obligation to buy!**




Whether your child is just a beginner or a computer wiz, he or she can expand their problem-solving and programming skills while reinforcing math, science and language arts with MICROZINE.

MICROZINE offers your child more built-in motivation *and* interactive learning power than any other software designed for an Apple computer.

*And MICROZINE is also the greatest value in software.*

At Scholastic, it wasn't enough to create the most challenging, most exciting, best learning software ever. It had to be the most affordable, too.

So affordable, your child can examine and explore the first four-program MICROZINE disk for 10 days—*free*. And if you decide to keep it, pay only $14.95. That's four fascinating, full-length educational programs for only $3.74 each!

So affordable, we'll send you a new MICROZINE disk every other month—always on a risk-free trial basis—for only $29.95, or $7.49 per program. Incredible, when you consider that one Apple software program alone typically costs $35 or more. And our prices include shipping and handling.

### The most powerful learning tools ever developed.

The award-winning MICROZINE series is unquestionably the highest-quality educational software available today. Based on school curriculums for children 9 to 13, each high-interest disk contains *four* original programs—so each is a library full of exciting learning opportunities.

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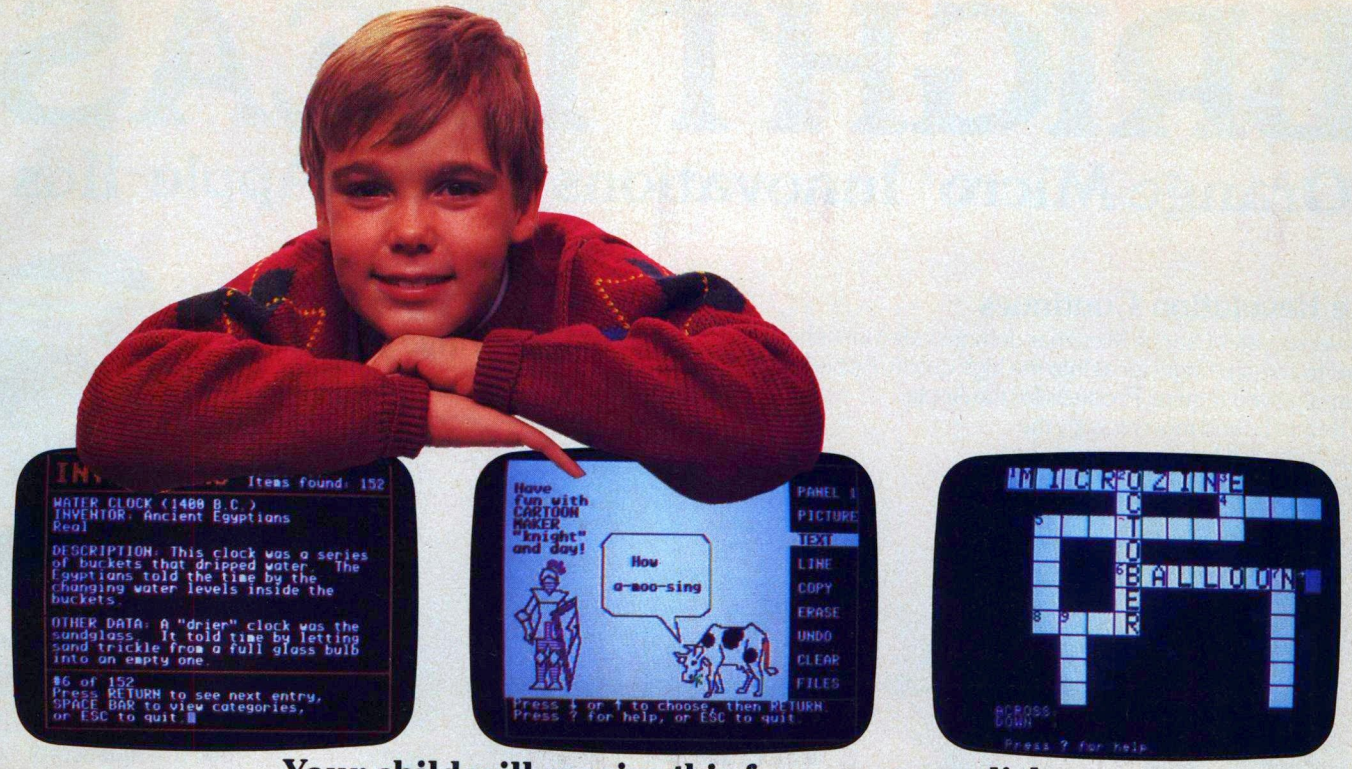
### An expanding library for an expanding young mind

Your second MICROZINE issue features *Brain Drain*, an exciting TWISTAPLOT outer-space adventure that enhances reading and decision-making capabilities; *Survey Taker* which teaches children how to conduct surveys on contemporary issues; *City Blocks*, a super-imaginative graphics program in which your child creates his or her own city scene; and *Back Page*, a thoroughly engaging electronic magazine. Each MICROZINE disk comes with a clear, self-instructional User's Manual. Together,

**The Funhouse Caper** is a totally involving TWISTAPLOT™ adventure in which your child solves three spine-tingling mysteries by questioning suspects and sleuthing for clues. The program *sharpens reading comprehension and map skills.*

***Give your child the educational advantage of a lifetime.***




## Your child will receive this four-program disk FREE for 10 days:

**Inventors and Inventions** brings science and database management vividly to life. Your child will probe a database of real and imaginary inventors and inventions to solve a puzzle—and *pick up valuable computer application skills in the process!*

**Cartoon Maker** enables kids to use more than 50 graphics of people, animals, fantasy characters and word balloons to create and print out their own cartoon strips. This irresistible program *teaches creative writing, art and design.*

**Puzzler** helps your child create, solve and print out crossword and "cross-number" puzzles, while *building vocabulary and improving math and problem-solving skills.*

they comprise a powerful educational library that will take your child to the very limits of his or her potential. And with your second purchase, you will receive free a sturdy MICROZINE file-a-disk case to hold your library disks.

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MICROZINE furnishes the tools your child needs to compete and excel in today's fast-paced world. An extraordinary opportunity you owe it to yourself to explore—cost-free, and obligation-free.

Order your introductory MICROZINE disk today. Send in the coupon, or call our toll-free number: 1-800-325-6149. (In Missouri, call 1-800-392-2179.) It's the educational advantage of a lifetime. Now, at the price of a lifetime.

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Yes, we're ready to try MICROZINE. Please rush our first four-program disk and enter our introductory subscription to MICROZINE, including a free User's Manual. Bill us at the special Introductory Rate of only $14.95 (which includes shipping and handling) for all four programs.

We will receive a new four-program MICROZINE disk *on approval* about every eight weeks (seven in a year), and be billed $29.95 for every disk we keep. We may cancel our subscription at *any* time, and are not obligated to buy even one additional MICROZINE. Moreover, if we are not delighted with the first MICROZINE, we may return it within 10 days and pay nothing.

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City _____ State _____ Zip _____

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Credit Card # _____ Exp. date _____

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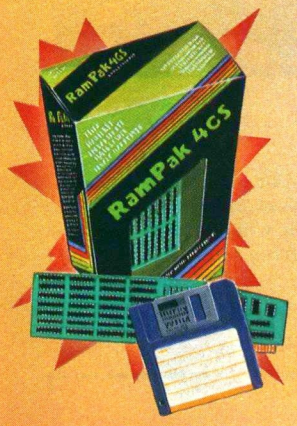
# BRIGHT IDEAS

## Orange Micro® Innovations for the Apple® IIGS

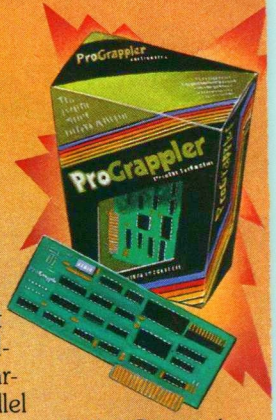
### The Revolution Continues

For over six years Orange Micro has demonstrated an unequalled ability to convert bright ideas into the high quality Apple innovations that you require. Products for the Apple II+, IIe and IIc and most recently the ImageWriter™ II have consistently been top sellers, and have enjoyed the support of experts and software publishers alike. With the new Apple IIGS computer, Orange Micro is again leading the way with three exciting new ideas to enhance your new Apple system.




## ProGrappler®

### Intelligent Printer Interfacing




Parallel printing is fast, and now the new **ProGrappler** represents the hottest technology in parallel printer interfacing. Screenshot capability (IIGS only) lets you print screens for most popular software packages. New pull-down menus accept either mouse or keyboard input, allowing you to easily select your printing options right on the IIe or IIGS screen. We've also added printer set-up, so you can select your printer's special features without complex commands or special codes. All the commands of the original Grappler+ have been kept intact, ensuring compatibility with the thousands of software products supporting the Grappler. Go with the **ProGrappler**, the most powerful parallel printer interface available.

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Orange Micro's new **RamPak 4GS** delivers unprecedented memory expansion capacity and powerful memory management utilities. With 512K of RAM standard, the **RamPak 4GS** is socketed and ready for an incredible *four megabytes* on a single card. But it's far more than just a simple memory card. The **RamPak 4GS** also includes powerful software for RAM Caching, Dynamic Memory Allocation, and utilizes Apple's RAM Disk. These features not only assure the most efficient use of your system memory in any application, but they can increase your processing speed dramatically.

## COMING SOON:
## IIGS Maintenance System

Your new Apple IIGS will require proper care, and Orange Micro's **maintenance system** has everything you need to keep your system running strong. The **maintenance system** provides surge protected power for your Apple IIGS and any two additional peripherals from a single convenient switch; a third unswitched power outlet; a powerful fan to provide filtered, cooling air; and an hour meter that tells you how long your system has been powered up. We have even included a guide of scheduled maintenance for use with the hour meter to help you properly care for your new computer. The **maintenance system** is a complete package that lets you relax knowing that your new investment is well protected.

## A Commitment to Innovation and Excellence

These high quality products represent Orange Micro's continued commitment to Apple and the landmark Apple II series of computers. Our development efforts are, and have been, totally dedicated to bright ideas for Apple Computers. We've been dedicated to it for years and we aren't going to change now. So when you pick up your IIGS, take a look at us. Enhance your system with solutions from Orange Micro.

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CIRCLE 258 ON READER SERVICE CARD

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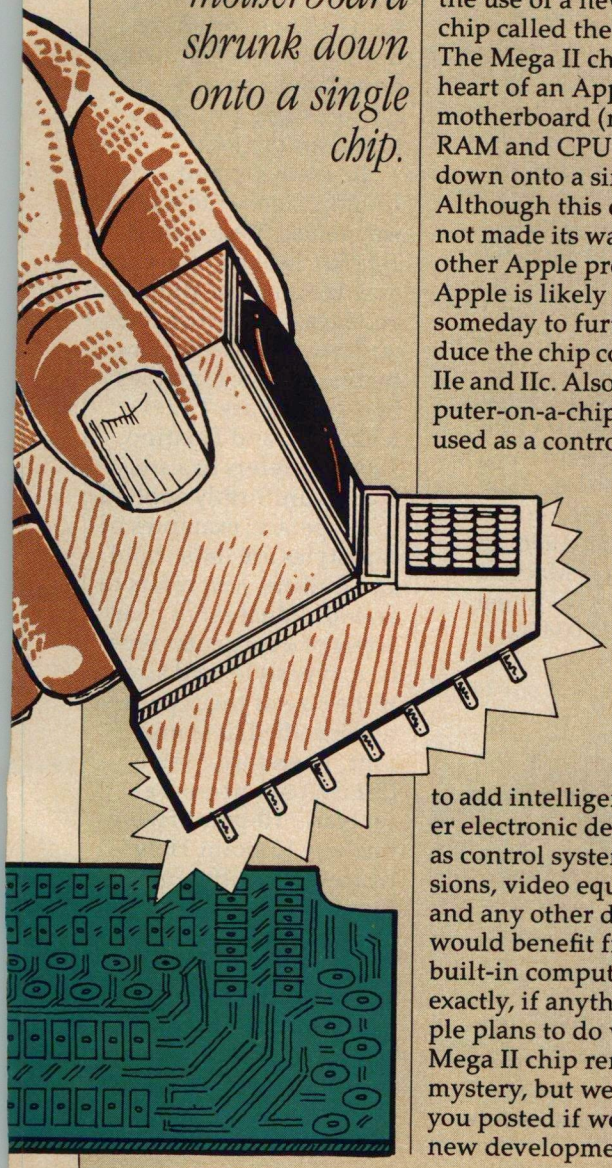
BY FREDERIC E. DAVIS AND CHIP CARMAN

# NewsPlus

*The Mega II chip of the IIGS is the heart of an Apple IIe motherboard shrunk down onto a single chip.*



## APPLE II ON A CHIP

The main reason that the Apple IIGS can run existing Apple II software is the use of a new Apple chip called the Mega II. The Mega II chip is the heart of an Apple IIe motherboard (minus the RAM and CPU) shrunk down onto a single chip. Although this chip has not made its way into any other Apple products, Apple is likely to use it someday to further reduce the chip count of the IIe and IIc. Also, this computer-on-a-chip may be used as a controller chip to add intelligence to other electronic devices such as control systems, televisions, video equipment, and any other device that would benefit from a built-in computer. What exactly, if anything, Apple plans to do with the Mega II chip remains a mystery, but we'll keep you posted if we hear of new developments.

## UNIVERSAL PERIPHERALS

With the introduction of the Apple Disk 3.5, the Hard Disk 20SC, and the new mouse and keyboard on the IIGS, Apple has moved closer to its goal of creating a group of universal peripherals for all Apple products. The above products, along with the existing ImageWriter II, LaserWriter, and Apple Personal Modem, work with either the Apple II or Macintosh product lines. This strategy will make it easier and less costly to upgrade from an Apple II to a Macintosh, since all your existing peripherals will be able to work with your new computer.

## PIRATE BBS

While several software publishers are removing copy protection, allowing users to copy application programs to their hard disks and keep an archival copy for backups, the Software Publishers Association is taking direct action to combat software theft. Through a private investigator, the group recently located and closed down a pirate bulletin-board system (BBS) called the Star Chamber, in Cincinnati, Ohio. The BBS had made available more than 40 megabytes of Atari software, including a disassembled version of the Macintosh ROMs that allowed some Mac software to run on a modified Atari ST.

BBSs and commercial information-retrieval systems such as GEnie, Delphi, CompuServe, and The Source provide an increasingly useful means for distributing information and ideas. The commercial services usually police their own systems. "The days are over when someone can illegally transmit copyrighted software via BBS systems," said Mark Skapinker of Batteries Included, one of the 12 publishers involved in the Star Chamber raid. The SPA will continue to monitor BBS systems and pursue individual piracy cases. "We're all fed up with tolerating theft of our products, and we intend to go after these scofflaws aggressively," added Gordon Monnier of Michtron, another publisher involved in the closing of the BBS.

*The Laser 128 has scored another legal victory in its struggle with Apple.*

## LASER 128 WINS IN HONG KONG

The Laser 128, the inexpensive Apple IIc clone from Video Technology featured in *A+*'s June 1986 cover story, has scored another legal victory in its struggle with Apple. The Customs Service approved entry of the Laser 128 into the U.S. several months ago, signaling that it found no copyright or patent infringements on the part of the Laser 128's ROM, and a recent court case in Hong Kong has reaffirmed the Laser 128's legality. Hong Kong, unlike the U.S., has laws that deal with design-patent infringements. The judge ruled that the IIc case and the Laser 128 case did not look similar enough to indicate design infringement.

The $399 Laser 128 is available in GEMCO and FEDCO stores or directly from its distributor, Central Point Software, 9700 SW Capitol Highway, #100, Portland, OR 97219; (503) 244-5782.

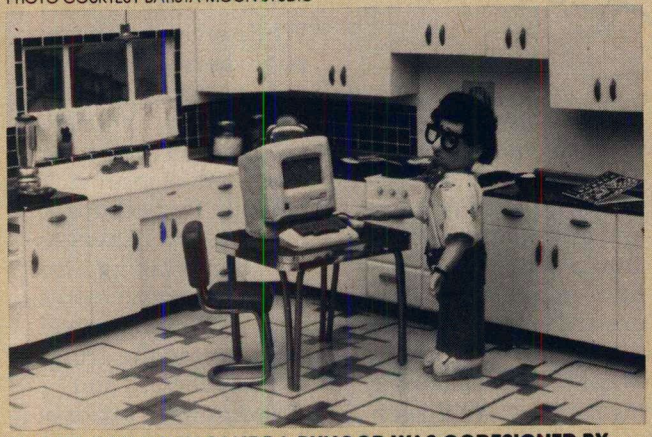
## APPLE II SCSI CARD

The SCSI (Small Computer Systems Interface) standard, which brought fast hard-disk drives to the Macintosh Plus, is now available for the Apple II series. At the same time as the IIGS announcement, Apple unveiled the Apple II SCSI card, which works with both the Apple IIe and IIGS and allows you to connect the computer to the Apple Hard Disk 20SC or SCSI hard disks from AST, ProAPP, General Computer, and other manufacturers.

## STRANGE BUT TRUE STORIES

MacConnection, distributor of Macintosh add-ons and software, is offering $500 worth of peripherals and programs to the winner of its contest to find "strange but true Mac stories." Entrants are encouraged to send in stories of "adventure, romance, mystery, and the occult. Mac applications that are so fascinating, far-fetched, or far-out that your fellow Mac fanatics will . . .feel all fuzzy around their foreheads." One of last year's most popular entries was from a woman who used MacPaint to create realistic 1950s interior decor for the family of miniature people who lived on her kitchen shelf. The deadline for the contest is December 31, 1986, and the address is MacConnection, 14 Mill Street, Marlow, NH 03456.

PHOTO COURTESY BATISTA-MOON STUDIO



**THIS SCULPTURE BY SANDRA PUNGOR WAS CODESIGNED BY ELLEN KLAGES, USING MACPAINT.**

## ABOUT FACE

The correct use of the terms *font*, *typestyle*, and *typeface* is tricky. A lot of confusion started with Apple's misuse of these terms in the Macintosh (and now the Apple IIGS) operating system. Apple used the term *font* to apply to an alphabet design such as Times or Helvetica, when in actuality the term should have been *typeface* or, in printers' lingo, simply *face*.

To set the record straight, here's the correct way to use these terms. *Typeface* refers to the general design of an alphabet and its associated characters, numerals, and punctuation marks; examples of typefaces are Times, Helvetica, and Palatino. *Typestyle* refers to a stylization uniformly applied to a typeface; examples of typestyles are italic, bold, and outline. *Font* refers to an individual set of characters of a particular typeface, typestyle, and size. If the size of the type is not specified, it is not a font. Therefore, Helvetica isn't a font—it's a typeface; 10-point Helvetica and 12-point Helvetica are two different fonts. In other words, a typeface is an entire group of fonts in all the various typestyles. We hope the use of these terms becomes more consistent as desktop publishing evolves and grows.

# A disk each month delivered to you...
## packed with ten programs for your Apple.

**DISCOVER UPTIME.** You deserve the best from your Apple. Have the best and save the most with UPTIME.

**We make it easy and inexpensive — a disk each month.** You deserve value. At UPTIME we believe in value. That's why each month 21,000 people like you enjoy a disk packed full of programs and information.

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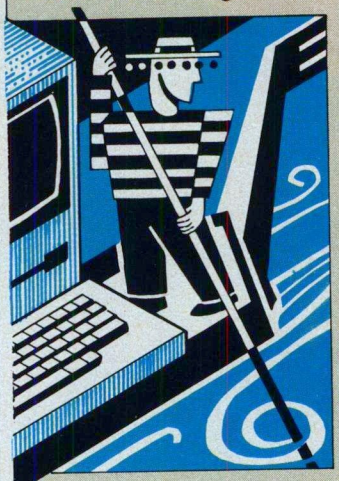
# NewsPlus

*Create a masterpiece with PageMaker and win a trip to Venice, Italy.*

## ALDUS TO ITALY

Venice, anyone? Have you been working hard creating your latest newsletter or other desktop-publishing masterpiece with Aldus' PageMaker program? If you are a registered PageMaker owner, you may be interested to know that Aldus Corporation is offering a trip to Venice, Italy, for the winners of its PageMaker



1986 design competition. Why Venice? It was the home of Aldus Manutius, the Renaissance printer and scholar for whom Aldus Corporation is named. You can enter the contest by sending three copies of a finished PageMaker-created publication and a completed entry form to Aldus Corporation, 411 First Avenue South, Suite 200, Seattle, WA 98104. The contest ends in December 1986.

## TWIST-A-PLOT

Scholastic, Inc., through Apple Computer Clubs International, invites youngsters in grades 2–8 to create an original project based on the Twist-A-Plot adventure programs in each edition of Scholastic Software's Microzine subscription software series. To enter the contest, children can illustrate the Twist-A-Plot in a poster, picture, cartoon, or computer graphic; create an original board game based on the adventure; or make up a new ending for the adventure.

Entries will be judged on creativity, attractiveness, and how well the project represents its corresponding Twist-A-Plot adventure.

Winners will be in two categories: grades 2–4 and grades 5–8. The judges will announce two first-prize winners, five second-prize winners, and five honorable mentions. First-prize winners will receive a one-year subscription to Microzine, the second-prize winners will receive one issue of Microzine, and honorable-mention winners will receive Apple Computer Club merchandise.

You may enter the contest as many times as you'd like. All entries must be postmarked no later than November 15, 1986, and the contest is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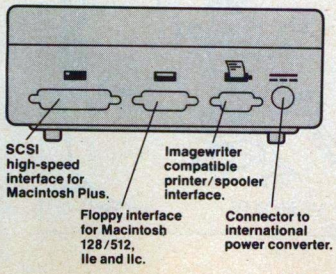


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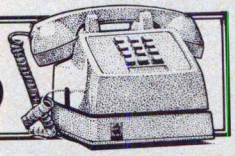

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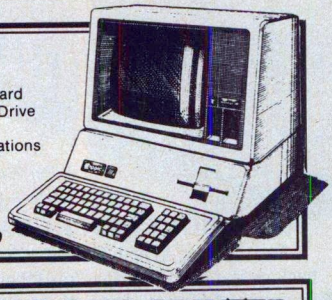

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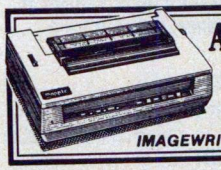

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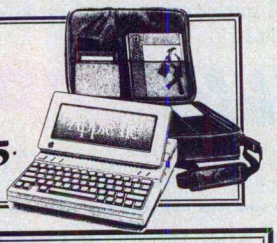

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# NewsPlus

*Your warped cartoon could win you the Infocom game of your choice.*

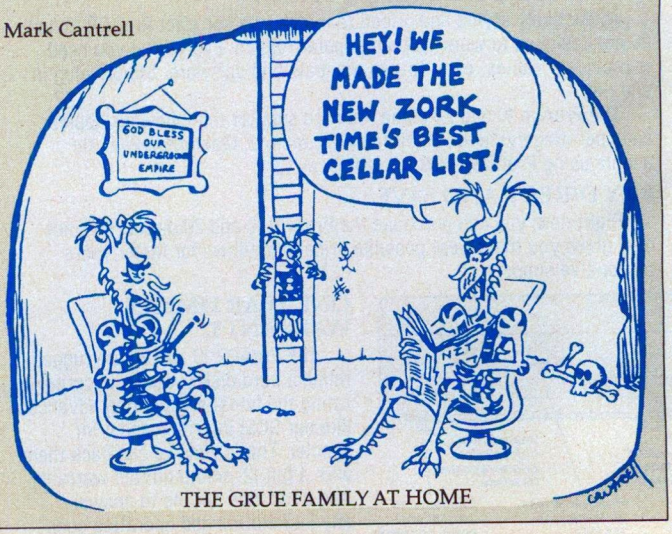
open only to members of Apple Computer Clubs International (see "NewsPlus" October 1986, page 19). For an entry kit or club membership information, contact Apple Computer Clubs International, Microzine Contest, 175 Middlesex Turnpike, Bedford, MA 01730; (800) 343-1425.

## NEW ZORK LINES

*The Status Line* (formerly *The New Zork Times*, but a certain newspaper in our nation's largest city did not like that), Infocom's quarterly newsletter, offers a puzzle and a cartoon contest in each issue. Usually the puzzle is game-related and involves obscure, humorous phrases. For example, the newsletter recently listed 17 phrases from the game Zork 1. Your mission was to find the two phrases that were not actually from Zork. (Even a Zork addict wouldn't find this challenge a snap). The top 25 winners win a "rare and treasured T-shirt."

For about a year now, the newsletter has run a cartoon contest. If your warped cartoon is chosen, you receive an Infocom game of your choice, and the cartoon is published in the newsletter. Cartoons must be drawn with black ink on white, unlined paper—no pencils or colors—and please do not fold your creation. Include on a separate piece of paper the name of the game you would like, should you win; the computer it should run on; and your name and address. To receive the newsletter, contact Info-Com, 125 Cambridge Park Drive, Cambridge, MA 02140, Attn: Status Line.

Mark Cantrell

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# NewsPlus

*Trying to get current information from Apple can be exasperating. Here's APDA to the rescue.*

## NEW APPLE ASSOCIATION

Well-informed programmers and developers are one of Apple's greatest assets, but trying to get current information from Apple has been an exasperating experience for them. Apple has responded by creating the Apple Programmer's and Developer's Association (APDA) to provide the entire Apple programming community with a reliable and inexpensive source of technical tools and information. Apple chose the A.P.P.L.E. Co-op, in Renton, Washington, to administer the project, because that group has been serving the Apple market since 1978. Memberships are available not just for professional hardware and software developers but also for individual programmers who are trying to learn how to get the best performance out of their Apples, as well as for educators and advanced students.

The APDA distributes Apple's own tools, utilities, and technical documentation, as well as third-party language products and technical books, such as Addison-Wesley's *Apple Technical Library*. The APDA plans to offer products more quickly than Apple does (it expects to ship products it has in inventory within 48 hours) and at a lower cost, although it won't include product updates in the price of a product. You can "subscribe" to products, however, meaning you automatically receive updates or revisions as soon as they're available—they are automatically billed to your account. Prerelease versions of products are also available, but they do not entitle you to receive discounts or free upgrades to the final products.

Commercial on-line services such as GENie, Delphi, and CompuServe will continue to offer the latest tools and technical information, but the APDA will carry other products that are either too large or complex for electronic distribution.

As a new APDA member, you will receive a membership kit and *APDAlog*, the group's quarterly newsletter, which contains product descriptions, price lists, and notices of the availability of new products. Memberships are $20. Contact Apple Programmer's and Developer's Association, 290 SW 43rd Street, Renton, WA 98055; (206) 251-6548. Be sure to tell them *A+* sent you! +

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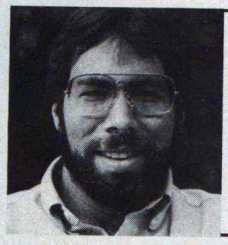

*"TransWarp is great! I have replaced all my other accelerators with it!"*

*Steve Wozniak, the creator of Apple Computer*

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IIGSIIGSIIGSIIGSIIGSIIGSI

**COVER STORY** *BY FREDERIC E. DAVIS*

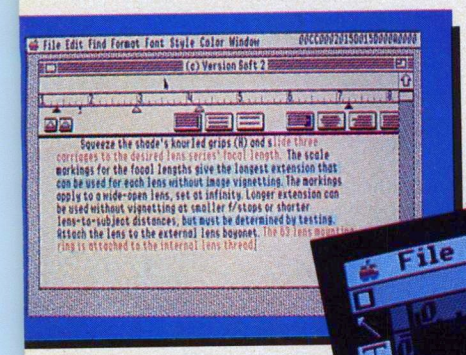
# HERE AT LAST!

The color Macintosh is here, but guess what: It's an Apple II. The Apple IIGS is the newest member of the Apple II family, and it brings Apple's Macintosh technology to the Apple II world in living color.

THE NEW APPLE IIGS

The Apple IIGS sports a lot of Macintosh-like features such as a mouse, pull-down menus, and windows. The IIGS will cost slightly less than $1000 for the CPU, keyboard, and mouse. Although the Apple IIGS falls somewhere between the Apple II and the Macintosh in terms of performance (the 16-bit processor in the IIGS is quite a bit faster than the 8-bit processor in the Apple IIe but not as fast as the 32-bit processor in the Macintosh), the IIGS is superior to the Macintosh in two areas: color and sound.

Apple chose the name IIGS to highlight these capabilities—the G in Apple IIGS stands for *graphics* and the S stands for *sound*. Although the Apple IIGS's color-graphics capabilities are quite impressive, they are not the best available; the sound, on the other hand, is outstanding and sets a new standard for personal computers. Some of the potential applications for

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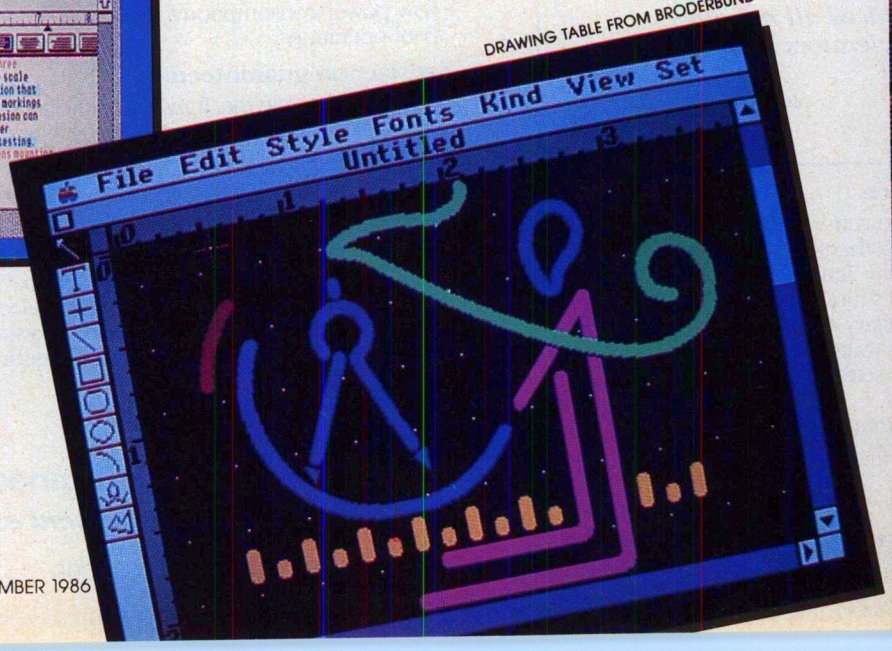


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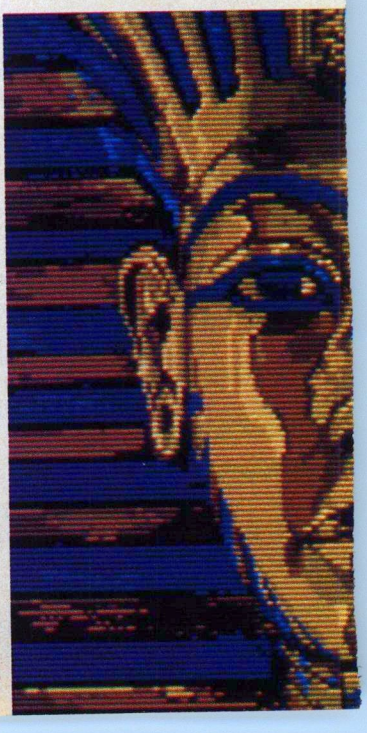
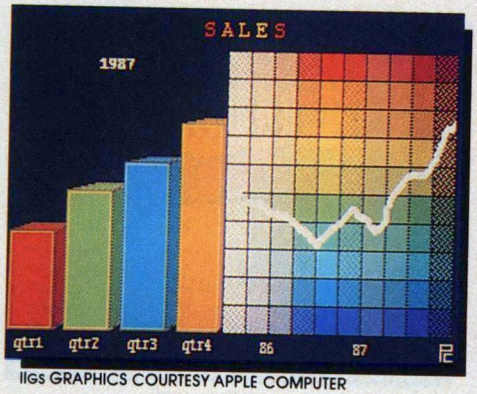


# THE APPLE IIGS!

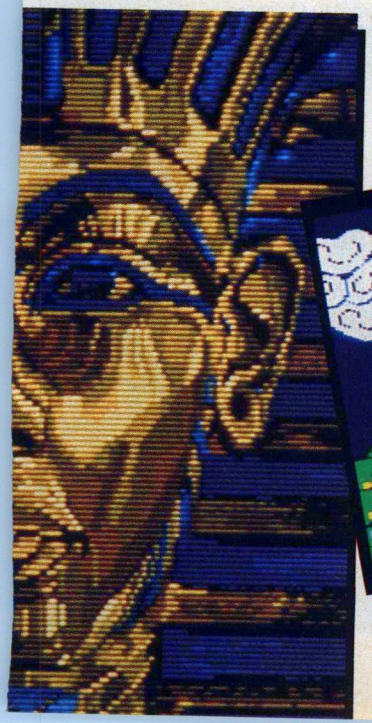
the Apple IIGS's sound capabilities include music education, sound analysis, voice mail, digitized voices, and talking foreign-language dictionaries.

We are always striving to make sure *A+* readers are the best-informed group of Apple users. In keeping with that goal, we have put together this special report on the Apple IIGS. Our coverage begins with this article, which gives you an overview of the IIGS-related products that are being developed by Apple and an impressive number of third-party developers. Next, starting on page 45, we have an article entitled "A Technical Overview of the Apple IIGS," which presents the main technical features of the new machine. Then, on page 57, comes "The Making of the Apple IIGS" that gives you the story behind the machine. The last of our feature articles on the IIGS is "What's in the IIGS Toolbox?" which begins on page 77 and covers the Macintosh-like Toolbox ROM, which gives the Apple IIGS a hefty dose of the Mac's personality.

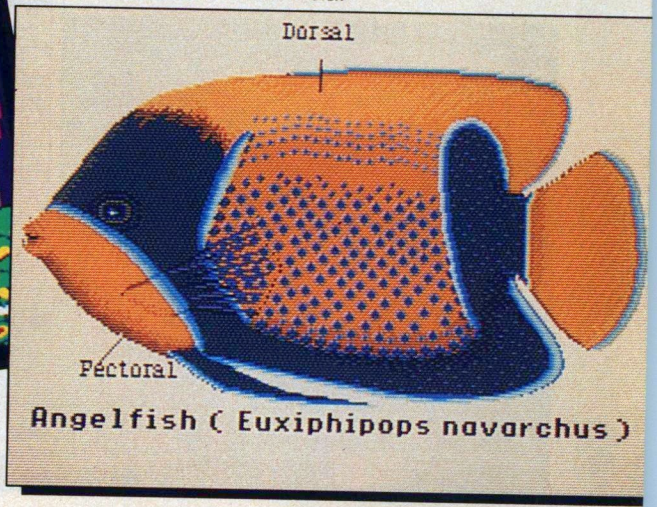


IIGS GRAPHICS COURTESY APPLE COMPUTER

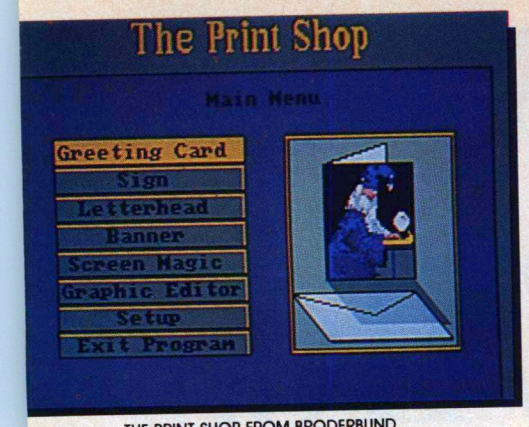
But that's not all; three of our top columnists present their views about the


DELUXE PAINT FROM ELECTRONIC ARTS

EXPLORE-A-STORY FROM LEARNINGWAYS



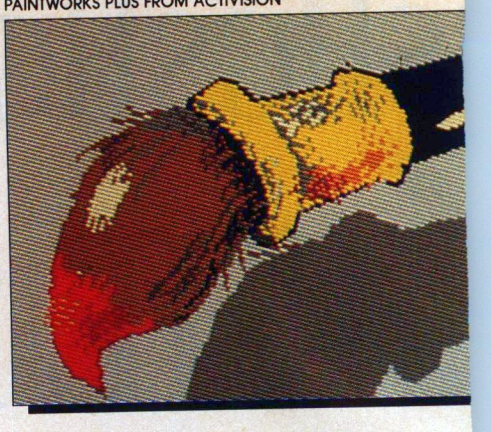
IIGS GRAPHICS COURTESY APPLE COMPUTER




THE PRINT SHOP FROM BRODERBUND

HARDWARE PRODUCTS FROM AST

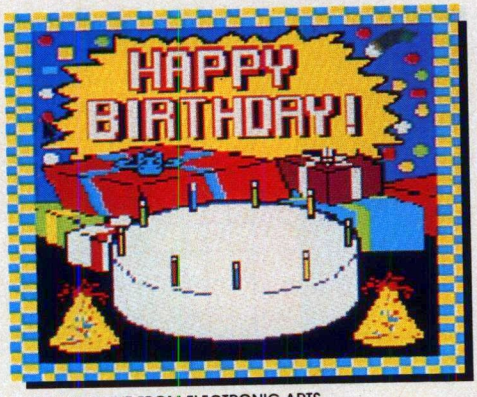
PAINTWORKS PLUS FROM ACTIVISION



IIGS in this issue. Don't miss David Thornburg's "Learning Curve," Steve Rosenthal's "Thoughtware," and Bob Lindstrom's new "GamePort" column.

## MORE APPLE ANNOUNCEMENTS

In conjunction with the announcement of the Apple IIGS, Apple also introduced the Apple 3.5 Drive, the Hard Disk 20SC, a SCSI card for the Apple IIe and IIGS, a monochrome monitor and an RGB color monitor for the IIGS, and a new version of the best-selling AppleWorks program (version 2.0) that includes a built-in mail-merge function. The Apple 3.5 Drive is a new standard 3.5-inch disk drive with 800K of storage capacity that works with either the Macintosh or the Apple II series. The Hard Disk 20SC is a SCSI version of the Macintosh Hard Disk 20 that you can connect to the Macintosh Plus' SCSI port or to an Apple IIe or IIGS, using the new Apple II SCSI board. For more details, refer to the technical specifications of the newly announced hardware products on pages 46–47 of this issue.

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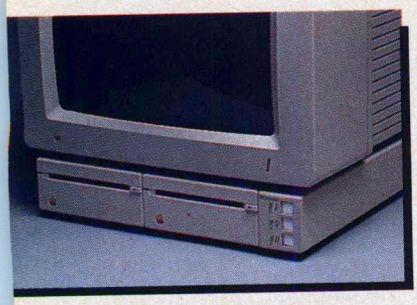
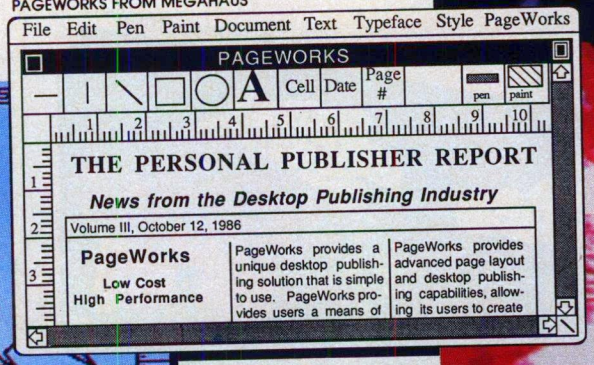
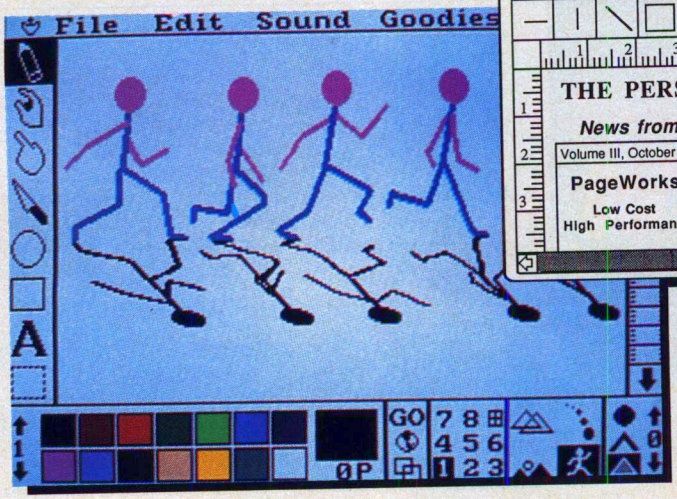


CONSERVER FROM MDIDEAS

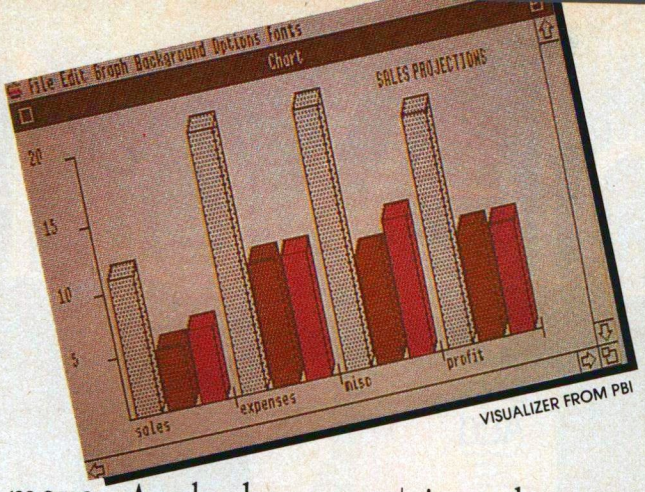
PAGEWORKS FROM MEGAHAUS



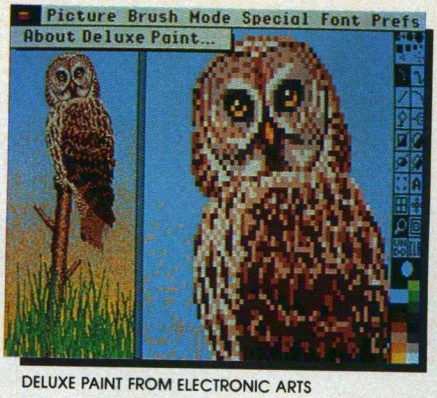

PAINTWORKS PLUS FROM ACTIVISION




FANTAVISION FROM BRODERBUND

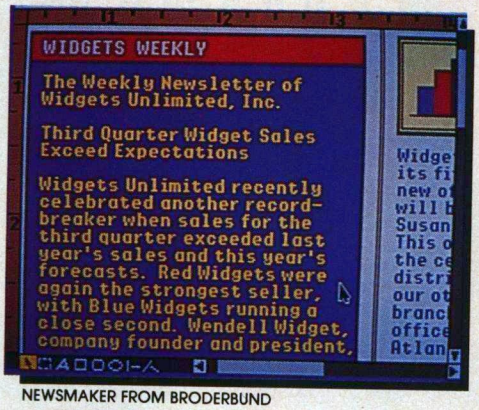



VISUALIZER FROM PBI




DELUXE PAINT FROM ELECTRONIC ARTS

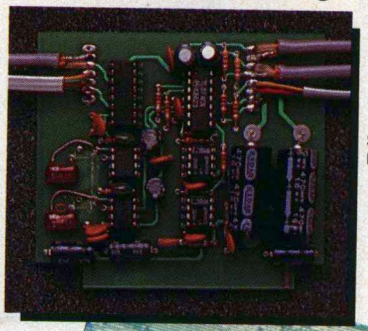
In a surprise move, Apple has announced a new color for all Apple products. You can say good-bye to the beige of the Apple II, II Plus, IIe, III, Lisa, Macintosh, and their associated peripherals; you can say good-bye to the snow-white color of the Apple IIc, ImageWriter II, Personal Modem, and LaserWriter. The new Apple color is, believe it or not, gray. Although some people at Apple are calling this new color platinum, I'm sticking with calling it gray. Beginning with the Apple IIGS, the new light gray is to become the standard color of all Apple products. Apple has already changed the color of the Apple IIc to this color, and you can expect the company gradually to convert the Apple IIe, Macintosh, and all its other hardware products to the new gray.




NEWSMAKER FROM BRODERBUND

## DEVELOPERS FLOCK TO THE IIGS

Software and hardware developers have given the Apple IIGS a warm welcome, and it looks as if new products will be developed for the IIGS at a much faster rate than they were for the Macintosh. Although development efforts are still jell-



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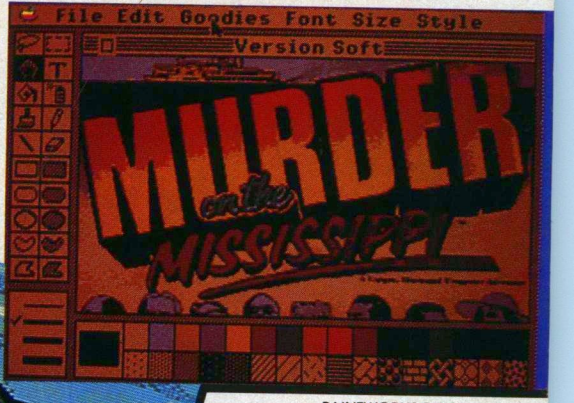
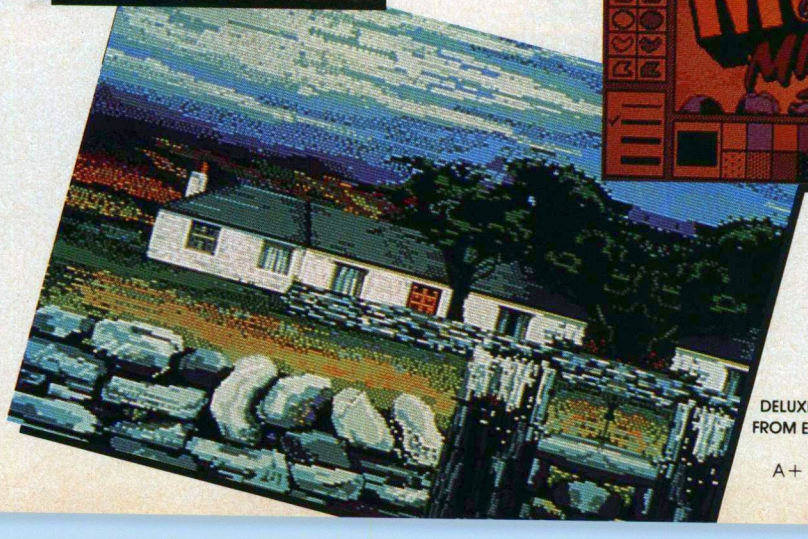



PAINTWORKS PLUS FROM ACTIVISION



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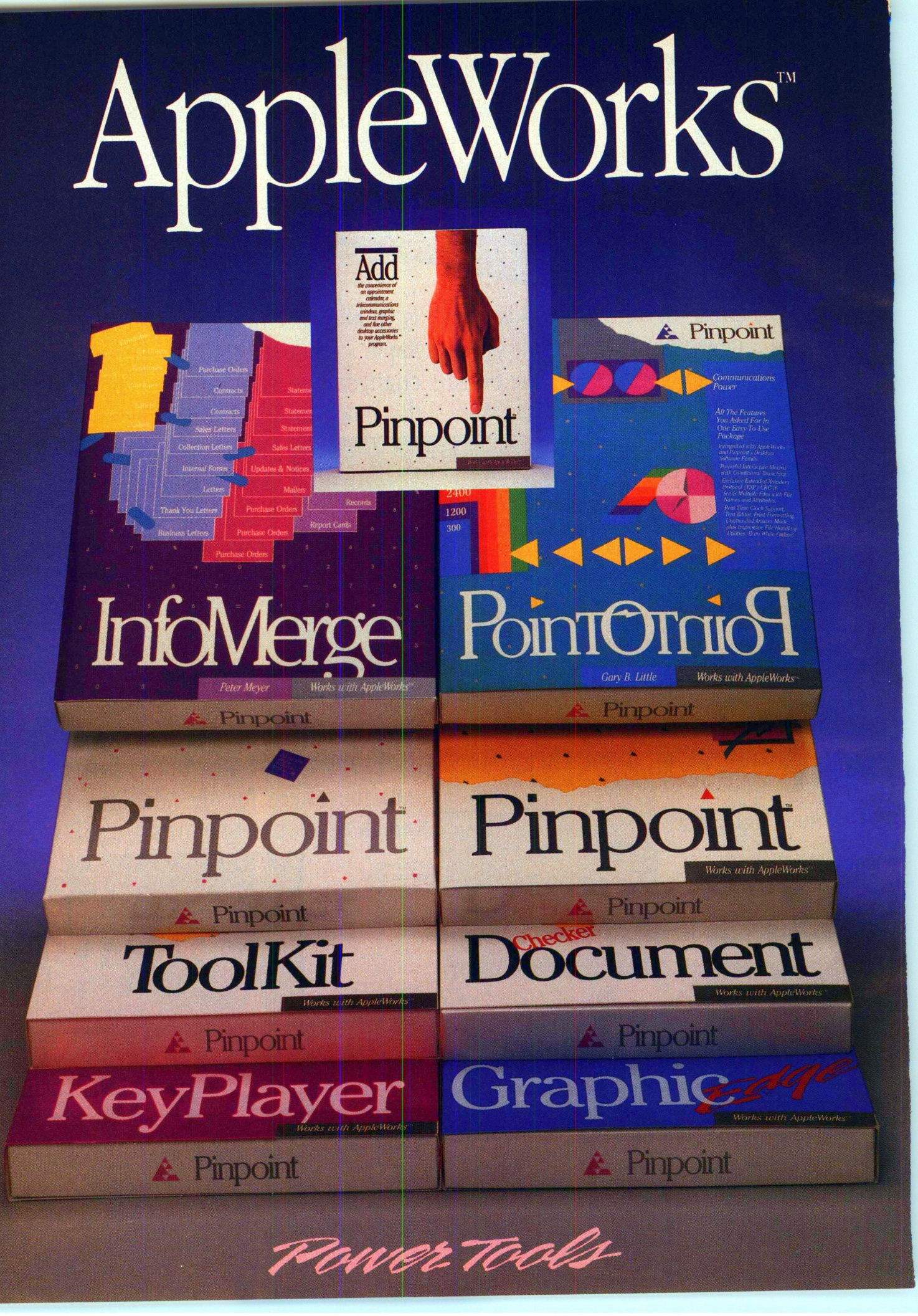
# AppleWorks™




*Power Tools*

# Power Tools

## *Over 500,000 people take a shortcut to work.*

APPLEWORKS SURE

There are reasons why AppleWorks is the number one software program for all Apple II's, including the new Apple IIGS.

And why AppleWorks is likely to remain #1 for years to come.

Quite simply, it has the power to get your most-needed work done.

And when it comes to adding value to this world-wide best seller, look to Pinpoint Publishing.

You'll quickly discover the power and convenience of an integrated line of software programs designed specifically to extend the capabilities and add flexibility to the way you work.

Take a close look and compare the complete AppleWorks/ Pinpoint solution to any other. Only then will you appreciate the security and performance of Apple Computer's own software family.

## *Picture this on your Apple IIc, IIe or new Apple IIGS.*

By Steve Cochard

CHART THE FUTURE

This Christmas, you could be producing stunning presentation graphics, charts and graphs, full-color slides and classroom view foils.

Introducing GRAPHIC EDGE. The charting and graphing program with the hot-link connection to AppleWorks' own spreadsheet data.

The color slide program with two million pixel resolution and nearly one million colors.

The color presentation program that works with Printshop and a dozen other new Apple II Series graphics programs all with cut-and-paste simplicity.

Starting at only $129.00 for your complete workstation software, GRAPHIC EDGE quickly grows into a complete production system ideal for school districts, small business and professional organizations.

Watch for GRAPHIC EDGE's exciting November introduction.

# Pinpoint

## *These accessories make AppleWorks twice as efficient.*

EIGHT GREAT REASONS

Add PINPOINT Desktop Accessories' complete selection of pop-up power tools to enhance your AppleWorks, or other selected ProDOS™ programs.

Just one keystroke away, this package contains the most-used AppleWorks productivity tools with great potential for growth built in! (See PINPOINT TOOLKIT, RUN-RUN, and KEY PLAYER™ below.)

Here's what's inside every PINPOINT Desktop Accessory box:

- Appointment Calendar
- Automatic Telephone Dialer
- Baby Word Processor / Pop-up Notepad
- Envelope Addresser/Labeler
- Four-Function Calculator
- Graphics and AppleWorks Document Merge Printing
- Memory-Writer Style Typewriter
- Telecommunications Window

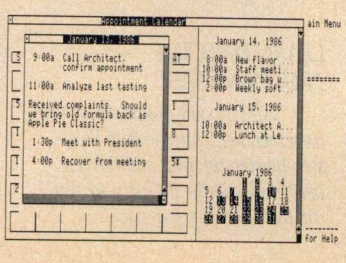
Each so well integrated with AppleWorks, you'll think of them as part of AppleWorks itself. And in a way, they are.

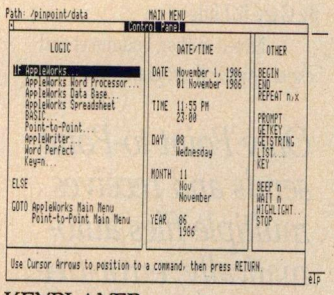
Yet, the amazing thing is, each desktop accessory is also a powerful ProDOS application.

**$149** **PP3/SP3**

PINPOINT and SPELLING CHECKER

Now, you can order both PINPOINT Desktop Accessories and the SPELLING CHECKER for one money-saving price. As a special bonus, we'll include our very helpful RAM ENHANCEMENT KIT, FREE!




KEYPLAYER

*Apple II Forever. Apple IIc, Enhanced IIe and hot new Apple IIGS.*

# ToolKit

**$89.00** **PP**
PINPOINT Desktop Accessories

**$49.00** **TK**
PINPOINT TOOLKIT
Programmer's resource and toolbox for writing Desktop Accessories all your own. Includes a Programmer's Calculator, pop-up ProDOS Filer, RunRun multi-tasking desktop and high-capacity disk drive manager, Memory Window, Resource Converter, Video Resource Editor, and the Accessory Mover. Requires Pinpoint Desktop Accessories.

**$69.00** **SP**
SPELLING CHECKER
Requires AppleWorks and Pinpoint

**$69.00** **DC**
DOCUMENT CHECKER
Requires AppleWorks

**$99** **SPDC**
SPELLING CHECKER and DOCUMENT CHECKER
Both spelling checkers in one convenient, money-saving package.

**$29.00** **RK**
RAM ENHANCEMENT KIT
Pinpoint recommended

**$29.00** **AK**
PINPOINT APPLE IIe UPGRADE

Pinpoint and Spelling Checker require an Apple IIGS, Apple IIc, Enhanced Apple IIe with 128K or Apple IIe with Pinpoint's Apple IIe Upgrade Kit and 128K; two Apple 5.25 drives, or one Apple 3.5 drive, hard disk or extended RAM card. Communications Window and Telephone Dialer require a modem. Most popular dot matrix printers and interface cards supported. Not copy protected. Contact Pinpoint Direct for a list of compatible hardware and software, or a FREE CATALOG.

# KeyPlayer

## *Macro Keys for AppleWorks.*

INSTANTLY BANISH BORING, REPETITIVE WORK FROM YOUR DESKTOP.

Watch KEY PLAYER turn one keystroke into complete turn-key AppleWorks solutions. Design new courseware and training applications, insert boiler plate text, or design interactive demonstrations.

KEY PLAYER can also add new capabilities to AppleWorks, and in time, other selected ProDOS applications. Commands like block delete with 'undo', delete word, and automatic save then print. Things that make every minute you spend with AppleWorks incredibly more productive.

You'll marvel at KEY PLAYER's amazing skill in adding pop-up menus, powerful 16-level nested macros, IF—THEN— ELSE conditional branching, automatic keyboard recording directly to an AppleWorks file for quick review and easy editing.

You can even assign one macro key to perform the same function inside different applications. So now, every application can have the same 'Save then Print' or 'Delete Word' command!

Good news, you can have all the power and convenience of KEY PLAYER's amazing macro keys on your PINPOINT Desktop.

Frankly, KEY PLAYER is the single most important and exciting AppleWorks productivity product for 1986.

**$49** **KP**

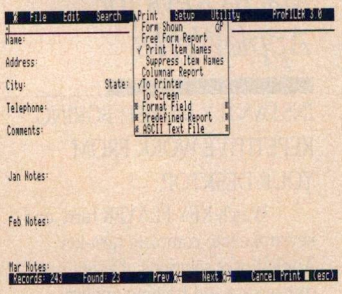
KEY PLAYER
Macro keys and scripting program for AppleWorks. Requires Pinpoint Desktop Accessories.

Requires Apple IIGS, Apple IIc, Enhanced Apple IIe with 128K or Apple IIe with Pinpoint's Apple IIe Upgrade Kit and 128K; two Apple 5.25 drives, or an Apple 3.5 drive, hard disk or extended RAM card. Not copy protected. Contact Pinpoint Direct for a list of compatible hardware and software or a FREE CATALOG.

CIRCLE 239 ON READER SERVICE CARD

# Power Tools

## *Add capacity and flexibility to your AppleWorks and PFS:File database files.*




### PROFILER

WORLD RECORD HOLDER

ProFILER 3.0 combines the most useful database and report-writing features, with the wonder of the Apple mouse. Powerful 65,000 record, 250 field (including text comment fields) capacity, and a free-form report writer means there are very few jobs ProFILER 3.0 can't tackle.

Plus, there's no need to reenter your most valuable Apple-Works and PFS:File databases to take advantage of ProFILER's impressive information management features.

Then add PINPOINT, PINPOINT TOOLKIT, RUN-RUN and KEY PLAYER compatibility to ProFILER's long, long list of power-ful features. This is the database manager to turn to when your AppleWorks runs out of gas.

**$129** **PF/PFL0**

PROFILER 3.0

Order today and we'll rush to you our $29.95 PROFILER LABEL UTILITY, FREE.

**$129.00** **PF**

PROFILER 3.0

**$79.00** **PF22**

PROFILER 2.2

Similar database management and report writing capabilities in an earlier, cursor-based version.

**$29.95** **PFL**

PROFILER LABEL UTILITY

Requires Apple IIGS, Apple IIc, Enhanced Apple IIe with 128K or Apple IIe with Pinpoint's Apple IIe Upgrade Kit and 128K; one Apple 5.25 drive, an Apple 3.5 drive, hard disk or extended RAM card. Not copy protected. Contact Pinpoint Direct for a list of compatible hardware and software or a FREE CATALOG.

## PointOPoint

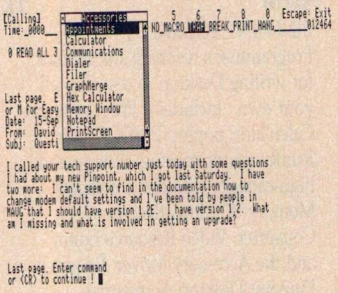
By Gary B. Little

Noted author, columnist and expert Apple II programmer.

## *Only Point-to-Point sends and receives multiple files auto-matically, error-free.*

NO CONVERSIONS OR RENAMING REQUIRED

This year's big communications news is Point-to-Point's exclusive Extended Xmodem Protocol (EXP) that automatically sends/receives batches of ready-to-run files, file names, hidden bits and all — error free. There's never been an easier way to share information, program updates, or entire computer solutions with people anywhere in the world.




COMMUNICATIONS POWER

Point-to-Point's got all the most-used features you'll use everyday. Powerful auto log-on macros go well beyond ordinary dial-the-phone, NAME and PASSWORD stuff. Including conditional branching, Quick-Key macros and real time clock support.

Yet everything is AppleWorks easy; right down to the familiar AppleWorks file card design, Open-Apple commands and immediately useful AppleWorks data files.

Add to that, simultaneous formatted printing, disk file capture and display while online, plus full 300/1200/2400 baud modem sup-port or direct-connect file transfers at up to 9600 baud.

SAY IT YOUR WAY

Point-to-Point's is the only communications program that lets you extend the value of your infor-mation using PINPOINT Desktop Accessories, PINPOINT TOOLKIT, KEY PLAYER and GRAPHIC EDGE (see descriptions below)!

Point-to-Point includes free or money-saving offers including CompuServe's Executive Service, Delphi,The Source, NewsNet, OAG, and GEnie.

**$129** **PT/RR0**

POINT-TO-POINT

Order today and we'll rush to you our $49.00 RUN-RUN ProDOS desktop manager, FREE.

**$50 Rebate** **PT2**

POINT-TO-POINT

At your option, instead of the free RUN-RUN offer above, receive a $50 Trade-In Credit for your old telecommunications software master disk, whose retail price was $50 or greater. Just send it, with your order for Point-to-Point, directly to "Trade-In Offer" c/o Pinpoint Direct, Box 13323, Oakland, CA 94661-0323. No returns, exchange only. Contact Pinpoint Direct at (415) 654-3050 for complete details.

Requires Apple IIGS, Apple IIc, Apple IIe, (Enhanced Apple IIe with 128K or Apple IIe with Pinpoint's Apple IIe Upgrade Kit and 128K required for Pinpoint Desktop Accessories' compatibility); one Apple 3.5 or 5.25 drive, hard disk or extended RAM card. Most modems and interface cards fully supported. Not copy protected. Contact Pinpoint for a compatible hardware list or a FREE CATALOG.

**$49** **RR**

RUN-RUN

The ProDOS desktop manager and disk organizer that runs multiple accessories at once. A must-have program for your Apple 3.5 drive, extended RAM card or hard disk. Ideal integrated environment for use with PINPOINT Desktop Accessories as stand-alone applications.

**$49.95** **QTT**

TEACHERS' TOOLS

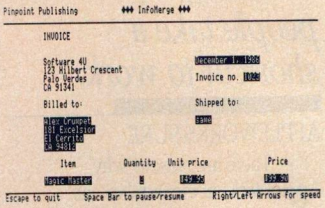
Student grading system with varying curves and standards, research and assignment files. An AppleWorks template program.

*LEARN PINPOINT PROGRAMS FAST*

*All Pinpoint programs include on-screen help, sample data files, step-by-step tutorials and the best user guides in the industry so you can learn at your own pace.*

## InfoMerge

By Peter Meyer




## *Tirelessly, this mail merge and database reporting program prints things AppleWorks never will.*

DIRECT MERGE PRINTING

Only INFOMERGE offers you on-screen, direct merge-printing, with direct AppleWorks database manipulation. Perfect for invoices, sales letters, report cards, standard agreements or for personalizing your holiday "Thank You" letters.

And you can do all this without bothersome record limitations or cumbersome clipboard "print files" imposed by AppleWorks and other add-on programs.

So stop retyping everything by hand, and let INFOMERGE deliver what-you-see-is-what-you-get printed perfection, every time.

NUMBERS ADD UP

Plus, only INFOMERGE includes powerful calculated fields with easy <QUANTITY> * <PRICE> = <TOTAL> formulas that can use AppleWorks' own catagory names. It's columnar printing is so savvy the decimal points even line up!

This way, sending invoices, statements and report cards is not only possible, but are suddenly simple to do.

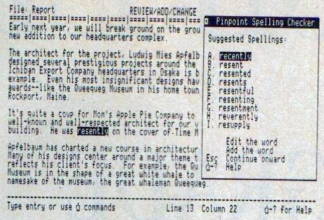
Much, much more than a mailing program, here are all the most-asked-for features that AppleWorks simply forgot.

**$79** **NF/QIB0**

INFOMERGE

Order today and we'll rush to you Q-Mar's INSTANT BUSINESS LETTERS program, worth $49.95, FREE.

# Spelling Checker




## *Finally, a choice in full-featured spell checkers.*

### POP-UP CONVENIENCE

Only Pinpoint Publishing offers you the choice. Our pop-up SPELLING CHECKER checks your documents without leaving AppleWorks behind. Check a word or a paragraph at a time, or check everything when you're done against our amazingly accurate 61,000-word dictionary.

SPELLING CHECKER displays up to 10 alternate spellings next to suspected misspelled words, then corrects and reformats using AppleWorks' own powerful editing commands. Or, at your option, you may add words to your own unlimited capacity personal dictionary for technical terms, abbreviations, names and places.

There're even special features like word counting, spell-checking summaries, and the ability to highlight misspelled words without displaying alternative spellings for vocabulary and word-skill lessons.

# Document Checker

### FASTEST BATCH SPELLING CHECKER

For long documents, reports or contracts, the stand-alone DOCUMENT CHECKER uses the full power of your Apple II to check up to 16 documents in sequence. The fastest AppleWorks spelling checker available, it checks your work at 30 to 150 words per second, thanks to Pinpoint Publishing's exclusive word cache design that actually increaces in speed the more documents you check!

DOCUMENT CHECKER features the same amazing 61,000 word dictionary and convenient check, suggest and correct features as our SPELLING CHECKER.

And because they both feature (and can share interchangeably) an unlimited capacity personal dictionary, every special word you add with one can be used by the other so there's no wasted effort.

No wonder most people take advantage of the high performance and special low price on this unbeatable spell checking team.

**$99** **SPDC**

SPELLING CHECKER and DOCUMENT CHECKER
Both spelling checkers in one convenient, money-saving package.

**$69** **SP**

SPELLING CHECKER
Requires Pinpoint and AppleWorks

**$69** **DC**

DOCUMENT CHECKER
Requires AppleWorks

Requires Apple IIGS, Apple IIc, Apple IIe, (Enhanced Apple IIe with 128K or Apple IIe with Pinpoint's Apple IIe Upgrade Kit and 128K required for Pinpoint and Spelling Checker compatibility); two Apple 5.25 drives, one Apple 3.5 drive, hard disk or extended RAM card. Not copy protected. Contact Pinpoint Direct for a FREE CATALOG.

**$399** **2400-G**

PROMODEM 2400G, New external 300/1200/2400 baud modem for Apple II, Macintosh or IBM PC. Cables not included.

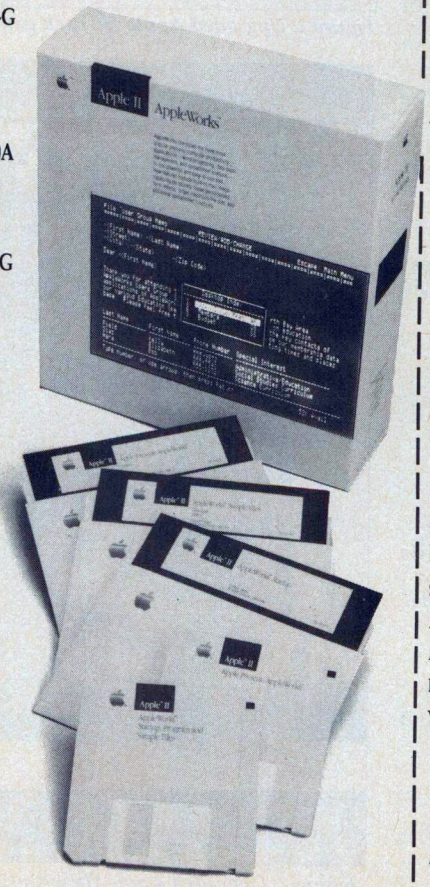
**$199** **PR-1200A**

PROMODEM-A2, New single-slot internal 300/1200 baud modem for the Apple IIe/IIGS.

**$199** **PR-1200G**

PROMODEM 1200G, New external 300/1200 baud modem for Apple II, Macintosh or IBM PC. Cables not included.

Apple II Forever.
Apple IIc, Enhanced IIe and hot new Apple IIGS.




*FREE OFFERS*

*FREE OFFERS are available for retail purchases, or orders placed directly with Pinpoint Publishing, between October 1st and December 31st, 1986.*

*To qualify, purchase the products listed in the offer, then send completed product registration cards, plus proof of purchase, to Pinpoint Publishing, Box 13323, Oakland, CA 94661-0323. Pinpoint Publishing will rush to you, by return mail, your special bonus products, FREE! Call Pinpoint Direct at (415) 654-3050 for complete details.*

*30 DAY MONEY BACK GUARANTEE*

*We're so certain you'll be completely satisfied with our software, we offer a no hassles 30-DAY MONEY BACK GUARANTEE for everything you purchase from Pinpoint Direct. Return orders subject to a 15% restocking charge.*

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*Power Tools* ▶

*24 Hour Toll Free Order Phone*

**800-633-2252/Ext. 636**

*Power Tools*

## *ORDER FORM*

*Order 24 Hours TOLL FREE* ▶

*800/633-2252 Ext. 636*

YES, Please rush to me the products I've checked below.

| | | | |
|---|---|---|---|
| PP | $ 89.00 | Pinpoint Desktop Accessories | ☐ |
| PP3/SP3 | 149.00 | Pinpoint & Spelling Checker | ☐ |
| | | *FREE $29.00 RAM Kit* | |
| TK | 49.00 | Pinpoint Toolkit | ☐ |
| SPDC | 99.00 | Spelling & Document Checker | ☐ |
| SP | 69.00 | Pop-up Spelling Checker | ☐ |
| DC | 69.00 | Document Checker | ☐ |
| PT/RR0 | 129.00 | Point to Point | ☐ |
| | | *FREE $49.00 RunRun* | |
| PT2 | 79.00 | Point-to-Point, Rebate Offer | ☐ |
| NF/QIB0 | 79.00 | InfoMerge Mail Merge | ☐ |
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| PF/PFL0 | 129.00 | ProFILER 3.0 Database | ☐ |
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| PF22 | 79.95 | ProFILER 2.2 Database | ☐ |
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| PFC/DOS | 12.00 | ProFILER Data Conv. | ☐ |
| KP | 49.00 | KeyPlayer Macro Keys | ☐ |
| RK | 29.00 | RAM Enhancement Kit | ☐ |
| AK | 29.00 | Pinpoint Apple IIe Upgrade | ☐ |
| RR | 49.00 | RunRun ProDOS Desktop | ☐ |
| PR/1200A | 199.00 | ProModem 1200A Internal | ☐ |
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| PR/2400G | 399.00 | ProModem 2400G External | ☐ |

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# THE APPLE IIe-TO-IIGS UPGRADE

One of the most exciting aspects of the Apple IIGS announcement is word that Apple IIe owners can upgrade their computers to an Apple IIGS. Just as Apple has offered Macintosh users upgrades from the 128K Mac to the 512K Mac and now to the Mac Plus, Apple has now established an upgrade path for the Apple II community, even though the upgrade is currently limited to owners of Apple IIe computers.

By upgrading your IIe to a IIGS, you will retain compatibility with most of your hardware and about 90% of your Apple II software while gaining the ability to run 100% of the new Macintosh-like software being developed for the IIGS. The upgrade involves simply swapping the IIe motherboard for a IIGS board and changing the back panel of the Apple IIe to accommodate the IIGS's built-in connectors (see figures 1 and 2 below).

Upgrading from an 8-bit IIe to a 16-bit IIGS will give you the new 65816 processor, better graphics and sound, two serial ports, the AppleTalk network, a built-in disk-drive controller, and the Apple DeskTop Bus mouse connector. You will still have the same seven slots, but certain slots are inactive when some of the built-in ports are in use. For example, a card in slot #1 will become inactive if the built-in serial port is used. On the other hand, a program looking for a serial card in slot #1 can use the built-in serial port if no serial card is in the slot.

Apple had not yet decided on the exact price or availability of the upgrade at the time of this writing, but it expects it to cost about $600. Contact your local Apple dealer for more details about the Apple IIe-to-IIGS upgrade policy.

Personally, I think that Apple's upgrade program should have been expanded to include Apple II, II Plus, IIc, and III owners, but the company does not plan to offer owners of these other 8-bit Apples an upgrade at this time. —*FD*

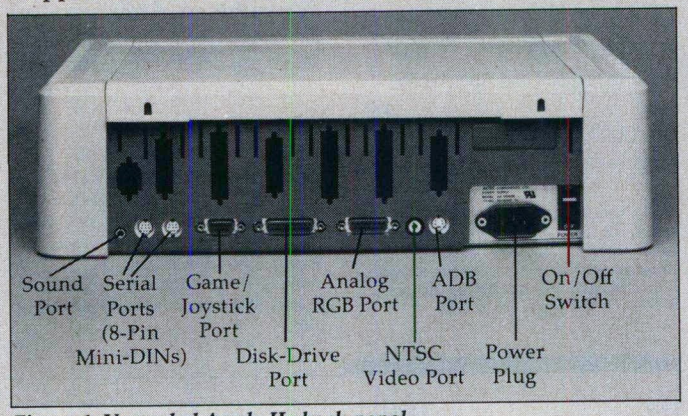


*Figure 1: Upgraded Apple IIe back panel*

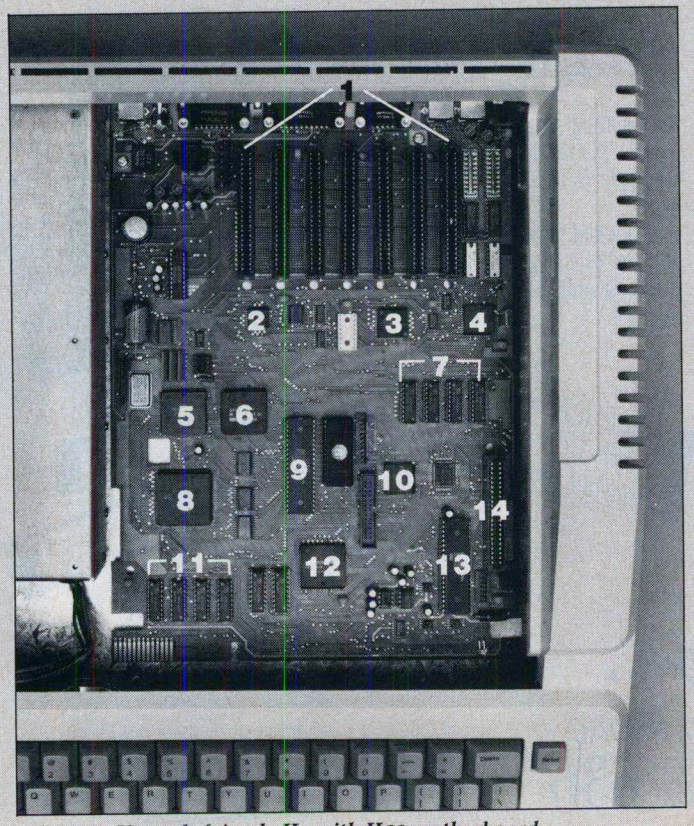


*Figure 2: Upgraded Apple IIe with IIGS motherboard*

1. **7 Expansion Slots**
   Compatible with the IIe
2. **IWM**
   Integrated Woz machine
   Single-chip disk controller
3. **SlotMaker**
   Manages the expansion slots by generating control signals and buffers several clock signals
4. **SCC**
   Serial Communications Control chip
   Provides AppleTalk
5. **VGC**
   Video Graphics Controller
   Provides all Apple IIe and IIc graphic modes and the new super-high-resolution modes
6. **FPI**
   Fast Processor Interface
   Controls system speed and "shadowing" and allows I/O access
7. **Fast 128K RAM**
8. **Mega II**
   Integrates various chips of the Apple IIe and IIc
9. **65C816 Processor**
   24 addressing modes: 13 original (65CO2) plus 11 new modes with 91 instructions, using 255 opcodes
   24-bit address bus for access to 16 megabytes of memory
10. **Keyboard GLU**
    Interfaces Apple DeskTop Bus to the system
11. **Slow 128K RAM**
12. **Sound GLU**
    Interfaces the Ensoniq chip, with its dedicated 64K RAM, to the Mega II, allowing the Ensoniq to run independently of the Mega II
13. **Ensoniq Sound Chip**
    32-oscillator synthesizer that, in most uses, will play 15 voices simultaneously
14. **Memory-Expansion Slot**
    Dedicated ROM/RAM expansion slot
    ROM—up to 1 megabyte
    RAM—up to 8 megabytes

ing as we finish preparing this special report, we've done our best to round up information on most of the initial products. Keep in mind that many of these products will not be available immediately and that most of the information simply represents what developers have told us. Next month's *A+* will include a chart with more details of new products for the IIGS (including the names and addresses of manufacturers), and future issues of *A+* will include actual product reviews. In the meantime, though, here's a brief roundup of the new products we've either seen or heard about:

Activision has created a MacPaint look-alike called Paintworks Plus and a MacWrite look-alike called Writer's Choice *elite* that look virtually identical to the analogous Macintosh products, with the important addition of color. The Paintworks Plus program is one of the first IIGS products we saw, and it looks like it and Writers Choice *elite* will be available right away. Activision is also working on a music-composition program called The Music Studio that should be out by the end of the year.

Applied Engineering is working on a 16-megabyte RAM card and an accelerator board for the IIGS. The accelerator board will supposedly run at 6 megahertz, as opposed to the IIGS's standard 2.8 megahertz.

AST Research will be offering several products for the IIGS: an exciting color-graphics digitizing board called the VisionPlus that works with NTSC standard video signals such as those used by VCRs, televisions, and other home video equipment; the Sprint Disk RAMdisk card; the RamStack IIGS 4-megabyte memory-expansion board; and a version of the AST 2000 hard-disk and tape-backup unit that allows mounting of the tape drive as a volume on the IIGS desktop.

Bose, a manufacturer of high-quality loudspeakers, has announced the Special Edition Roommates. These speakers are a special version of Bose's Roommate speakers that the company has issued in a special light-gray color to match the new Apple look and connect to the IIGS's sound port. The Roommate speakers are smallish high-quality speakers with a built-in amplifier that were designed to amplify portable tape players and compact-disc players.

*It looks as if new products will be developed for the Apple IIGS at a much faster rate than they were for the Macintosh.*

Brøderbund has four impressive new products for the IIGS: NewsMaker, a desktop-publishing/page-layout program that features color printing on the ImageWriter II and high-quality printing on the LaserWriter or any other PostScript printer; Drawing Table, a MacDraw-like object-oriented drawing program in color that allows importing of bit-mapped images and is compatible with the LaserWriter; Print Shop IIGS, a complete revision of this classic program that allows color-graphics editing and color printing; and Fantavision IIGS, a major update to Fantavision that features sound and super-high-resolution graphics.

Chancery Software is coming out with CSL Marks, which is a sophisticated grade-book program for teachers that the company also offers for the Macintosh.

DataDesk is a manufacturer of alternative keyboards for the IBM PC market, and it has developed the Turbo-ADB Keyboard, an IBM-style professional keyboard with 15 function keys that works with the newly announced Apple DeskTop Bus standard for connecting keyboards, mice, and other input devices to the IIGS (and future Apple computers). This type of keyboard should prove especially useful when IBM PC compatibility comes to the IIGS (which should be within six months—we'll keep you posted).

Electronic Arts has converted its Deluxe Paint from the Amiga and its Deluxe Music Construction Set for the Macintosh to run on the IIGS. The Deluxe Music Construction Set, in fact, looks as if it is the first major product to take advantage of the IIGS's fantastic sound capabilities.

First Byte has taken its Smooth-Talker speech-synthesis technology, developed on the Macintosh, and redesigned four of its programs to take advantage of the IIGS's superior sound capabilities. The company has announced four educational programs aimed at students in the kindergarten through ninth grade: KidTalk, for creative writing; Speller Bee, for alphabet and spelling skills; MathTalk, for elementary math; and First Shapes, for a simple introduction to geometry.

General Computer, best known as the developer of the Hyperdrive for the Macintosh, is introducing a version of its FX20 external SCSI hard-disk drive for the IIGS.

Great Wave Software has drawn on its Macintosh development efforts to come up with KidsTime II, which is really a combination of two programs: ABKey and KidsNotes. ABKey is an alphabet and keyboard-skills game, and KidsNotes is a beginners' music tutorial.

Kurta Corporation has created a new type of graphics tablet that features a cordless pointing device that can double as a mouse. Decent graphics tablets for the Apple II have always been in short supply; this product should be a real help in exploiting the Apple IIGS's graphics capabilities.

MacNifty Central is working on a modular multifunction board code-named Project Phoenix. The board's first module is a sound digitizer with 256K of RAM that allows you to sample, edit, and play back sounds, much as you would with the firm's SoundCap system for the Macintosh (see "Digital Sound for the Mac" on pages 106–113 of the May 1986 issue of *A+*). The second module adds NTSC-standard video-digitizing capabilities with advanced software that features real-time frame grabbing and special effects such as chroma-key, color-shift, and color-printing capabilities. The third module adds a MIDI interface that will supposedly allow you to upload and download sounds to and from MIDI instruments. The fourth module, not likely to appear until well into next year, will be a process-control center for use in such varied applications as

home control and robotics.

MDIdeas is offering the SuperSonic stereo sound board to allow you to hook up stereo speakers to the IIGS; the OctoRam 8-megabyte RAM-expansion card; and The Conserver, a combination power strip, surge-suppressor, fan, and monitor platform that allows you to place two 3.5-inch drives between the IIGS monitor and system unit.

MicroProse has converted its Silent Service submarine-simulation game to work on the IIGS.

Orange Micro has several products for the IIGS: ProGrappler, a printer interface with menu-driven software in ROM; RamPack 4GS, a four-megabyte RAM card; and The JuiceBox, a power-strip/fan combination.

Peak Systems is offering a variety of SCSI storage devices for the IIGS. The Sierra 2040 combines a 20-megabyte hard-disk drive with a 40-megabyte tape drive, and the Sierra 3040 is a similar unit with a 30-megabyte hard-disk drive; the interesting thing about these units is that they have an automatic timer that can automatically back up the hard disk onto the tape drive at a specific time. Peak is also offering its Plus series of stand-alone storage devices, which include 20-, 30-, 45-, and 65-megabyte SCSI hard-disk drives and a 20-megabyte tape drive.

PBI has two IIGS programs, CommWorks 16 and Visualizer. CommWorks 16 is a communications

# QUICK-REFERENCE GUIDE TO IIGS PRODUCTS

*This table contains a sampling of products, and the preliminary information herein is based on manufacturers' claims. For further information on any item in this table, please circle the corresponding Reader Service Number on the reader-service card in this issue.*

## HARDWARE

| COMPANY | PHONE | PRODUCT | DESCRIPTION | READER SERVICE NUMBER |
|---|---|---|---|---|
| Apple Computer, Inc. | (408) 996-1010 | Apple 3.5 Drive | Disk drive | — |
| | | Apple 5.25 Drive | Disk drive | — |
| | | Apple SCSI Card | SCSI-interface card | — |
| | | Hard Disk 20SC | SCSI hard-disk drive | — |
| Applied Engineering | (214) 241-6060 | (16-megabyte RAM board | Memory-expansion card | — |
| | | (Accelerator board) | Add-in board | — |
| AST Research, Inc. | (714) 553-0340 | AST-2000 | SCSI hard-disk drive | 506 |
| | | RamStack IIGS | Memory-expansion card | 507 |
| | | SprintDisk | RAMdisk card | 508 |
| | | AST VisionPlus | Graphics digitizer | 509 |
| Bose Corporation | (617) 879-7330 | Special Edition Roommate | Speakers | 510 |
| DataDesk | (800) 826-5398<br>In CA: (818) 780-1673 | Turbo-ADB Keyboard | IBM PC-style keyboard | 511 |
| General Computer Corp. | (617) 492-5500 | Hyperdrive FX-20 | SCSI hard-disk drive | 512 |
| Kurta Corporation | (602) 276-5533 | Kurta Graphic Input System | Digitizing tablet (mouse alternative) | 513 |
| MacNifty Central | (612) 566-0221 | ("Phoenix") | Modular multifunction board | 514 |
| MDIdeas | (415) 573-0580 | Conserver | Combination power strip/surge suppressor/fan and monitor platform | 515 |
| | | OctoRam | Memory-expansion board | 516 |
| | | SuperSonic | Stereo sound and amplifier board | 517 |
| Orange Micro, Inc. | (714) 779-2772 | JuiceBox | Power-strip/fan combination | 518 |
| | | ProGrappler | Menu-driven printer-interface board that allows various screen dumps | 519 |
| | | RamPack 4GS | 4 megabytes of memory expansion | 520 |
| Peak Systems, Inc. | (512) 329-1020 | Plus20 (30, 40, 65) | 20-, 30-, 40-, or 65-megabyte SCSI hard-disk drive | 521 |
| | | Plus20T | SCSI tape backup | 522 |
| | | Sierra 2040 | 20-megabyte SCSI hard-disk drive and 40-megabyte auto tape backup | 523 |
| | | Sierra 3040 | 30-megabyte SCSI hard-disk drive and 40-megabyte auto tape backup | 524 |
| ProAPP, Inc. | (408) 559-3552 | ProAPP10, ProAPP 20 | 10- and 20-megabyte SCSI/disk-port hard-disk drive | 525 |
| Street Electronics Corp. | (805) 684-4593 | Echo IIb | Speech synthesizer | 526 |

program that features VT-100 terminal emulation and offers add-on modules for text editing, bulletin-board systems, emulation of other terminals, and more. Visualizer is a business-graphics package that can use data directly from AppleWorks and can overlay charts and graphic images.

ProApp is offering its ProApp 10 and ProApp 20 10- and 20-megabyte hard-disk drives, which feature both a disk-port connector and a SCSI connector. The drives can be partitioned into a separate volume for each of the two ports, so two computers can use the drive (not simultaneously).

Roger Wagner has made some IIGS enhancements to its MouseWrite word-processing program; the firm is coming out with Merlin 16, a 65816 version of MerlinPro; and perhaps of greatest interest is a product tentatively called SoftSwitch, a Switcher-like program for the IIGS that allows you to load and switch between multiple applications.

Styleware has developed MultiScribe GS, a IIGS version of its innovative MultiScribe program for the IIe and IIc. MultiScribe GS allows you to edit multiple documents at the same time and allows cutting and pasting of graphics into a document. The company also says it is working on a MacDraw-like object-oriented drawing program for the IIGS that prints in color on the ImageWriter II or in high-quality black and white on a La-

## SOFTWARE

| COMPANY | PHONE | PRODUCT | DESCRIPTION | READER SERVICE NUMBER |
|---|---|---|---|---|
| Activision, Inc. | (415) 960-0410 | Music Studio | Music-composition and -education software | 527 |
| Brøderbund Software, Inc. | (415) 479-1700 | PaintWorks Plus | MacPaint look-alike | 528 |
| | | Writers Choice *elite* | MacWrite look-alike | 529 |
| | | Drawing Table | MacDraw-like (object-oriented) application | 530 |
| | | Fantavision | Animation with sound | 531 |
| | | NewsMaker | Desktop-publishing/page-layout software with color drawing and printing | 532 |
| | | Print Shop IIGS | Menu-driven color-graphics editor | 533 |
| Chancery Software | (604) 685-2041 | CSL Marks | Grade-book software | 534 |
| Chang Labs | (800) 831-8080<br>In CA: (800) 972-8800 | Rags to Riches | Accounting package | 535 |
| Electronic Arts | (415) 571-7171 | Deluxe Music Construction Set | Software for composing, editing, and playing music scores | 536 |
| First Byte, Inc. | (213) 595-7006 | Deluxe Paint | Paint program | 537 |
| | | FirstShapes | Elementary geometry program | 538 |
| | | KidTalk | Beginning creative-writing software | 539 |
| | | MathTalk | Beginning math-skills software | 540 |
| | | SpellerBee | Alphabet and spelling tutorial | 541 |
| Great Wave Software | (415) 325-2202 | KidsTime II | Typing and music tutorial | 542 |
| Learningways, Inc. | (617) 576-3007 | Explore-A-Story | Creative-writing software | 543 |
| MECA | (203) 222-1000 | Managing Your Money | Personal-finance software | 544 |
| MegaHaus Corp. | (619) 450-1230 | PageWorks | Desktop-publishing/page-layout program | 545 |
| MicroProse Software, Inc. | (301) 667-1151 | Silent Service | Submarine simulation | 546 |
| Monogram | (213) 215-0355 | Dollars and Sense | Personal-finance software | 547 |
| Orange Micro, Inc. | (714) 779-2772 | Color Paint | Paint program | 548 |
| PBI Software, Inc. | (415) 349-8765 | CommWorks 16 | Telecommunications software | 549 |
| Quark, Inc. | (303) 934-2211 | Visualizer (desktop-publishing software) | Business-graphics package | 550 |
| | | | Desktop-publishing/page-layout product | 551 |
| Roger Wagner Publishing, Inc. | (619) 562-3670 | Merlin 16 | 65816 assembler | 552 |
| | | MouseWrite | Word-processing program | 553 |
| | | SoftSwitch | Switcher-like program | 554 |
| Scholastic, Inc. | (800) 325-6149 | Talking Text Writer | Creative-writing software | 555 |
| StyleWare, Inc. | (713) 668-1360 | (Draw program) | MacDraw-like (object-oriented) program | 556 |
| | | MultiScribe GS | Word-processing program | 557 |
| TML Systems, Inc. | (904) 636-8592 | Pascal | IIGS version of TML Pascal for the Mac | 558 |
| Tom Snyder Productions | (617) 876-4433 | Puppy Love | Artificial-intelligence simulation | 559 |
| United Software | (818) 887-5800 | ASCII Express | Telecommunications software | 560 |
| | | MouseTalk | | |
| VIP Technology Corp. | (805) 968-4045 | VIP Professional | Integrated spreadsheet, database, and charting software | 561 |

serWriter or other PostScript printer.

Tom Snyder Productions is developing a IIGS version of its delightful Puppy Love program (see "News-Plus," September 1986, page 15), which combines fun and games with artificial-intelligence instruction. The company expects the program to be available through Addison-Wesley by Christmas.

TML Systems has created a IIGS version of its Macintosh Pascal language that allows programmers to write Pascal programs that run on both the Macintosh and the IIGS.

United Software has taken a lot of the features of its classic ASCII Express Pro telecommunications program and combined it with a Macintosh-like user interface to create ASCII Express MouseTalk, which promises to be one of the most powerful mouse-driven communications programs for any computer.

VIP Technology is developing a IIGS version of its VIP Professional spreadsheet that combines the Apple user interface with a Lotus 1-2-3 clone. In fact, VIP claims that the program is compatible with Lotus 1-2-3, Version 1A and can use the same files and commands as 1-2-3.

*This is just the tip of the iceberg. We'll be sure to keep you up to date on new IIGS happenings in upcoming issues of A+.*

On the desktop-publishing front there is quite a bit of activity. Besides Brøderbund, which has the aforementioned NewsMaker, MegaHaus and Quark are producing their own programs. MegaHaus has introduced PageWorks, and Quark is developing Quark Extra. All of these packages work with the LaserWriter and other PostScript printers.

In the area of financial management and accounting, Chang Labs has converted its popular Rags to Riches accounting program from the Macintosh to the IIGS, Monogram has converted the Macintosh version of the best-selling Dollars and Sense to the IIGS, MECA has written a IIGS version of its Managing Your Money program, and VIP Technologies is producing a IIGS version of its VIP Professional spreadsheet.

In the education arena, Learningways is working on a version of its Explore-A-Story program that makes use of some IIGS features, and Scholastic is tweaking Talking Text Writer to take advantage of some of the IIGS's capabilities.

**Tip of the Iceberg**

All in all, a very respectable amount of new products is in development for the IIGS; indeed, the above list is just the tip of the iceberg. We'll be sure to keep you up to date on new IIGS happenings in upcoming issues of *A+*.

Following this article is the continuation of our special report on the IIGS. Read on and enjoy. ✚


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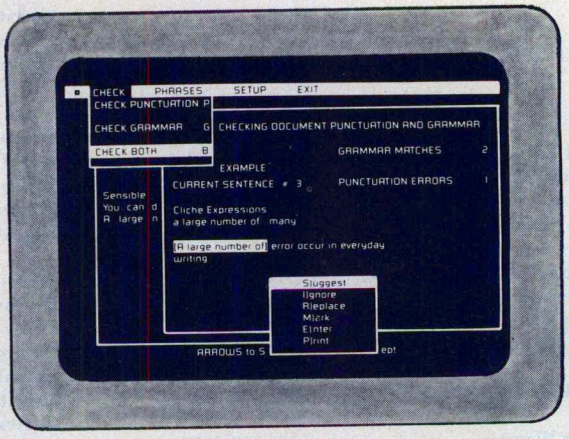

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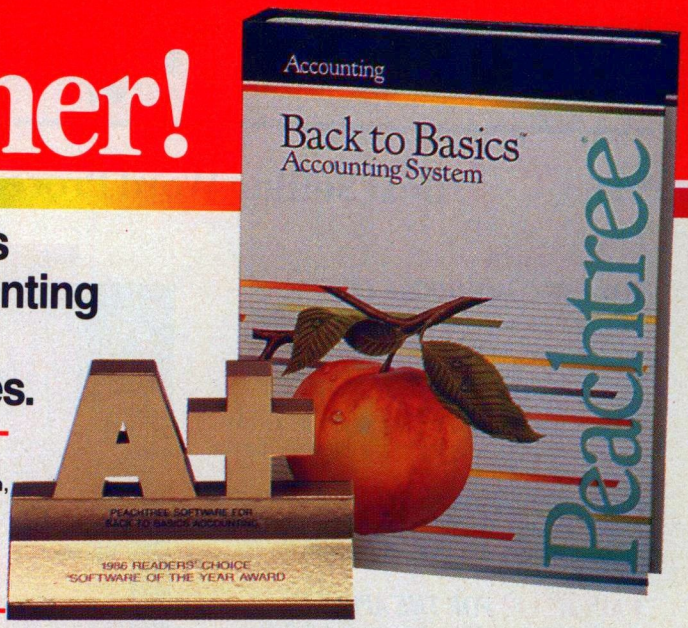


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- **Void transaction facility** automatically creates reversing entry.
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- User modifiable Chart of Accounts included.
- Allows up to 3 checking accounts.
- Up to 10 departments with separate income statements.

**ACCOUNTS RECEIVABLE**
- Calculates receivables on balance forward basis.
- Prints statements and mailing labels.
- Allows automatic posting to General Ledger.
- Accepts partial payments.
- Calculates finance charges.
- Up-to-date customer information can be scrolled for review at any time.
- Customer ID's can be alpha or numeric.
- Verifies customer credit limit.
- Calculates up to 3 sales taxes per entry.

**ACCOUNTS PAYABLE**
- Up to 10 vendor payment terms.
- Calculates cash discounts.
- Accepts partial payments.
- Automatic posting to General Ledger.
- Prints vendor mailing labels.
- Up-to-date vendor information can be scrolled for review at any time.
- Customer ID's can be alpha or numeric.
- Prints computer checks or processes hand-written checks.
- Invoices automatically or manually selected for payment.

### AND THESE ARE SOME OF THE REPORTS YOU GET WITH THE SYSTEM:

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- Vendor Master List
- Trial Balance
- Detailed General Ledger
- Detailed Accounts Receivable
- General Journal
- Disbursements Journal
- Sales Journal
- Income Statement
- Balance Sheet
- Check Register
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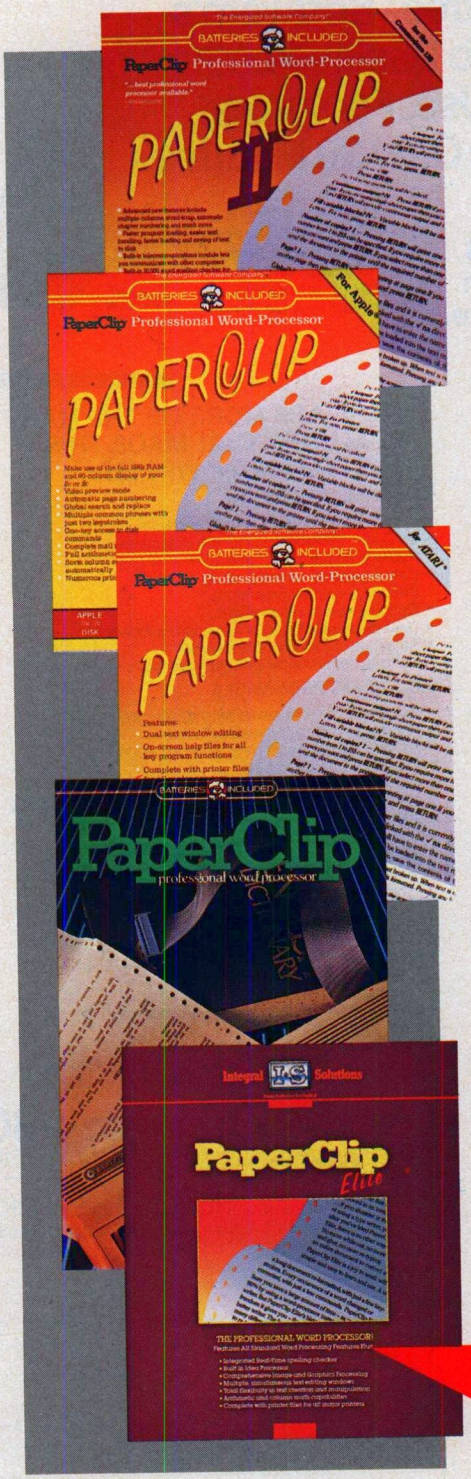


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**HARDWARE** *BY GARY B. LITTLE*

*Getting acquainted with Apple's latest offspring*

# A TECHNICAL OVERVIEW OF THE APPLE IIGS

In October 1983, Steve Wozniak, inventor of the original Apple II, made some remarkably candid statements in an electronic conference on CompuServe. Commenting on Apple's future plans for the II series, he said we could expect to see a new machine by the middle of 1984 that would use "a revolutionary 6502-based processor" and be able to access 16 megabytes of memory directly.

He was referring to the so-called Apple IIx project, but, for a variety of reasons, notably the infatuation of the Apple brass with the Macintosh (announced in January 1984), the project was ultimately scrapped.

But now, three years after this initial hint of things to come, Apple has finally created a computer that meets Woz's tantalizing specifications: the Apple IIGS. The GS stands for *graphics* and *sound*, the two sexy features Apple will use to lure customers from the grasp of Commodore and Atari. In this article, I'll explain what makes the GS so special.

**The 65816 Microprocessor**

The GS uses the Western Design Center 65816 microprocessor, a powerful device that has, in its native operating mode, 16-bit data registers, 24-bit addresses, and a 16-megabyte address space. The 65C02 microprocessor of the IIe and IIc, which offers 8-bit data registers, 16-bit addresses, and a 64K address space, is a lightweight by comparison (see figure 1).

The main reason Apple decided to use the 65816 was that it could also operate in an emulation mode in which it mimicked a 65C02 exactly. Apple has combined this ability to emulate with a clever hardware design that converts part of the 65816 memory space into a IIe-compatible memory space. The result is a computer with considerable growth potential that also works with almost all existing IIe software. Users will have plenty of software to use on the GS until the more powerful native-mode applications and applications that take advantage of new features such as graphics and sound are available.

Here are some other features of the 65816 that make it an attractive microprocessor for software developers:

- The direct page (the new name for the 65C02's zero page) can go anywhere in the first 64K of memory—not just on page 0—meaning that an application can use its own direct page, so you don't have to worry about overwriting reserved areas (but you can still have only one direct page at a time).
- The stack can also go anywhere in the first 64K, not just on page 1, and it can be larger than a single page. Thus, the computer can handle more stack operations, such as passing parameters and keeping track of nested subroutines.
- The A, X, and Y registers can be 8 bits or 16 bits in size. The use of 16-bit registers instead of 8-bit registers simplifies mathematical and indexing operations involving numbers greater than 255 (but less than 65536).
- Several new instructions and ad-

dressing modes are available that let you develop faster and more compact programs.

**System Speed**

The 65816 of the GS operates at an effective clock rate of either 1 MHz or 2.5 MHz, selectable through a software switch. In the fast mode (2.5 MHz), the GS operates much like a IIe with an Applied Engineering TransWarp card (or similar speedup card)—about 3½ times as fast as usual. (Actually, a IIe with an accelerator card operates faster than the GS.) In the slow mode, the GS operates at the same speed as a standard IIe or IIc.

**Memory Space**

The 65816 treats memory as a consecutive series of 256 banks, each 64K in size, rather than as one continuous 16-megabyte space (see figure 2). A GS, in its minimal configuration, uses only six of these banks, four for RAM (256K) and two for ROM (128K).

The core RAM banks are numbers $00, $01, $E0, and $E1. You can add more RAM by installing a memory card in a special memory-expansion slot on the motherboard; this RAM occupies consecutive banks starting with bank $02. Apple's memory card can hold up to four megabytes, although you'll probably use only 256K or one megabyte until memory prices drop. The GS ROM occupies banks $FE and $FF and contains Applesoft (yes, the same old Applesoft), an enhanced system monitor, firmware for built-in I/O ports, and some programming tools.

All IIe-style applications load and run in banks $00 and $01 on the GS. They work properly because the GS hardware configures these two banks to behave like main and auxiliary memory on the IIe, complete with language-card (bank-switched-RAM) spaces. The main difference is that the simulated main and auxiliary memory areas contain no special video memory buffers for the text and graphics display modes. (You store data in a video buffer when you want to change what's displayed on the screen.) These buffers are in RAM banks $E0 and $E1 instead.

A IIe application still works properly on the GS, however, because every time it writes to what it thinks is a video buffer in bank $00 or $01, the GS causes a write to the actual buffer

# Technical Specifications

## Apple IIGS

**PROCESSOR**
65816 microprocessor, 2.8 MHz clock speed, 8-bit data bus; 24-bit address bus allows for addressable memory of 16 megabytes

**MEMORY**
256K RAM standard, expandable to 8 megabytes
128K ROM standard, expandable to 1 megabyte

**OPERATING SYSTEMS**
Works with ProDOS 16, ProDOS 8, Pascal, CP/M (with Z80 card), and DOS 3.3

**EXPANSION SLOTS**
8: 1 dedicated multipurpose RAM/ROM memory-expansion slot; 7 additional input/output slots

**GRAPHICS DISPLAY**
7 video-display modes:
—40-column text mode (by 24 lines)
—80-column text mode (by 24 lines)
Low resolution: 40 H by 4 V dots, 16 colors
High resolution: 260 H by 192 V dots, 6 colors
Double high resolution: 560 H by 192 V dots, 16 colors
Super high resolution: 320 H by 200 V dots, 16 colors per scan line out of a palette of 4096 colors; 640 H by 200 V dots, 4 colors per scan line out of a palette of 4096 colors

**SOUND CAPABILITY**
Ensoniq 32-oscillator synthesizer chip with dedicated 64K RAM

## Apple 3.5 Drive

**RECORDING MEDIA**

| | |
|---|---|
| Disk Diameter: | 3.5 inches |
| Recording Surfaces: | 2 |
| Tracks Per Surface: | 80 |

**CAPACITY**
Formatted: 800K

**INTERFACE**
Connects directly to Apple IIGS or Macintosh disk-drive port

**DRIVE CHARACTERISTICS**

| | |
|---|---|
| Seek Time: | 6 milliseconds max. |
| Settle Time: | 30 milliseconds max. |
| Drive Start-up Time: | 600 milliseconds max. |

## Apple 5.25 Drive

**RECORDING MEDIA**

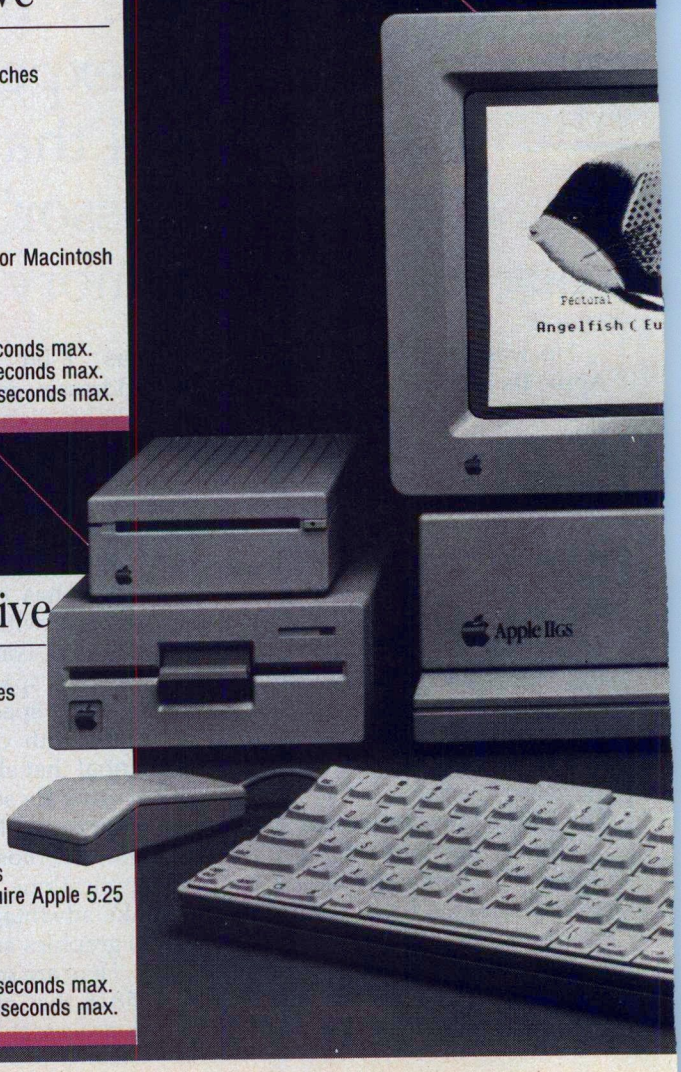
| | |
|---|---|
| Disk Diameter: | 5¼ inches |
| Recording Surfaces: | 1 |
| Tracks Per Surface: | 35 |

**CAPACITY**
Formatted: 140K

**INTERFACE**
Connects directly to Apple IIGS and IIc; IIe, II Plus, and II require Apple 5.25 Drive Controller

**DRIVE CHARACTERISTICS**

| | |
|---|---|
| Seek/Settle Time: | 50 milliseconds max. |
| Drive Start-up Time: | 1.0 milliseconds max. |



**INTERFACES**
NTSC-compatible composite color-video output
Analog RGB video output
Headphone jack with programmable volume control
Apple DeskTop Bus input port for keyboards, mice, and other input devices
SmartPort disk interface for connecting both 5.25 and 3.5 Drives
Two serial ports using the SCC communication chip
Game/joystick port
Input/output sound connector on logic board

**CLOCK/CALENDAR**
Built-in clock for automatic date stamping of files

## Apple Hard Disk 20SC

**RECORDING MEDIA**
Two double-sided, rigid, nonremovable disks with two dual read/write heads

**CAPACITY**

| | | | |
|---|---|---|---|
| Data Capacity: | 20 megabytes (formatted) | Total Disk Blocks: | 39360 |
| Data Surfaces: | 4 | Sectors Per Track: | 32 |
| Heads Per Surface | 1 | Block Size: | 532 bytes (512 bytes user data, 20 bytes system data) |

**INTERFACE**
Connects directly to the Macintosh Plus via the SCSI 50-pin port connector; and to the Apple IIe and Apple IIGS via the expansion port, using the Apple II SCSI Interface Card

**DRIVE CHARACTERISTICS**

| | | | |
|---|---|---|---|
| Seek Time: | 65–85 milliseconds | Start-up Time: | 9 seconds |
| Transfer Rate: | 1.25 Mb/second | Spin-down Time: | 20 seconds |
| Rotational Speed: | 2744 RPM | | |

## Apple DeskTop Bus

**KEYBOARD**
Detached 80-key typewriter-style keyboard including 10-key numeric keypad

**MOUSE**
Apple DeskTop Mouse, standard

in bank $E0 or $E1 as well, causing screen updating—a process called shadowing. The I/O space from $C000 to $C0FF is also shadowed, since the actual I/O locations exist only in banks $E0 and $E1.

To maintain compatibility with existing Apple II peripherals and to respect video timing constraints, all activity in banks $E0 and $E1 takes place at a speed of 1 MHz, even if the GS has been told to operate in the fast mode. Therefore, the system slows during screen updates, reducing performance somewhat, particularly for graphics-intensive applications. Screen-read operations, however, can take place at full speed if the application reads from the shadowed video-buffer area in bank $00 or $01.

The operating-system subroutines in the system ROM use most of the non-video-buffer areas of banks $E0 and $E1 for data storage. Some free space is left over that a 65816 native-mode application can use, however.

**Slots and Ports**

From an I/O point of view, the GS combines the best of the IIe and IIc: It has seven expansion slots, as the IIe does (plus the special memory-expansion slot I mentioned above), and five built-in I/O ports, as the IIc does. You can't use them all at the same time, however, since the ports emulate cards in slots. You tell the GS whether you want to use a port or its corresponding slot by using a Control Panel desk-accessory program in the GS ROM. (You can call up the Control Panel any time by pressing Control/open-apple/ESC; when you leave it, your application returns intact.)

The built-in I/O ports are two serial ports (one of which you can use for AppleTalk), an 80-column text-display port, a mouse port (a mouse is standard equipment on the GS), and a disk-drive port.

The serial ports are controlled by the Intel 8530 Serial Communications Controller (SCC), the same chip the Macintosh uses. Since Apple did not employ the 6551 chip it uses in the IIc and the Super Serial Card, most existing communications programs do not work on the GS. These programs generally access a serial port's hardware registers directly, but they aren't familiar with the new 8530 yet. Publishers of such com-

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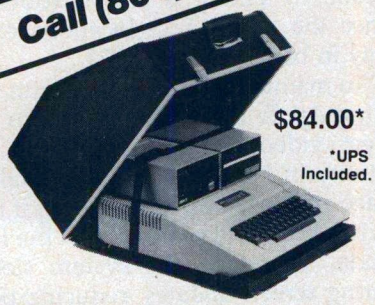

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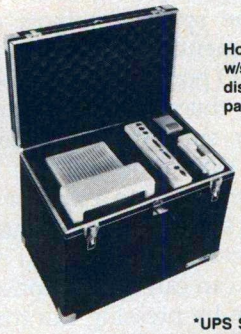

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munications programs will probably announce updates shortly.

The disk-drive port, called the Smart Port, can handle up to four external drives connected in a daisy-chain arrangement. The standard GS package has one 800K UniDisk 3.5 drive connected to this port.

The connectors for the two serial ports and Smart Port are at the back of the GS system unit. There you will also find connectors for a game controller, the keyboard, and composite (NTSC) and RGB video. The connector for the mouse is on the side of the keyboard.

The seven internal expansion slots are almost identical to their IIe counterparts, meaning that most single-function cards available for the IIe also work on the GS. Multifunction cards that create phantom slots (such as the AST Multi-I/O and the Street Electronics BusinessCard) do not work, however, since the 65816's 24-bit addresses confuse them. Of course, you won't need to use cards such as these anyway, since the GS already includes ports for the most popular I/O functions.

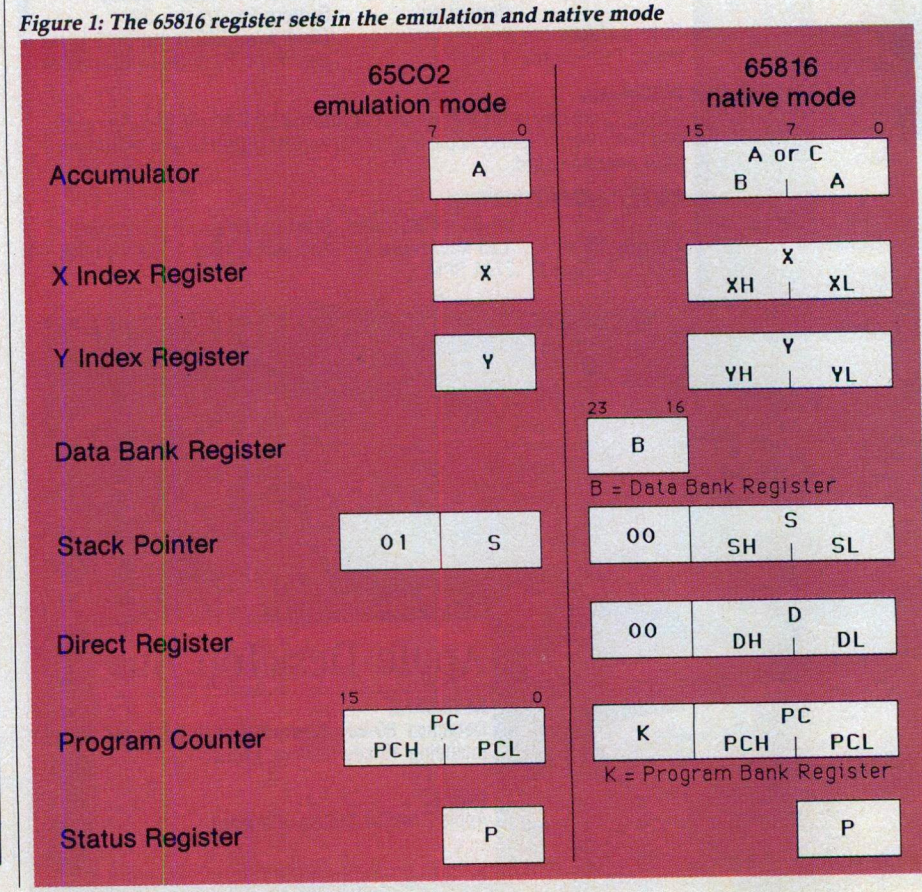
### The Keyboard

The GS keyboard has all the features of the IIe keyboard, and more. Two improvements are noticeable immediately: The keyboard connects with a flexible cord to the system unit and includes a numeric keypad. The keyboard has several other features:

- Different keyboard layouts are available, including QWERTY (of course), Dvorak, and others such as French, German, USA, English, and more. The character-generator ROM contains eight different character sets to go along with the keyboard layouts.
- The auto-repeat speed is user-selectable.
- The keyboard has a type-ahead buffer.
- You can read the up/down state of each of the modifier keys (Caps Lock, Shift, and Control) directly.

You can use the Control Panel to change many of the operational characteristics of the keyboard. Since these characteristics are stored in a battery-backed-up memory area, the GS remembers them every time you restart the system.

***Figure 1: The 65816 register sets in the emulation and native mode***



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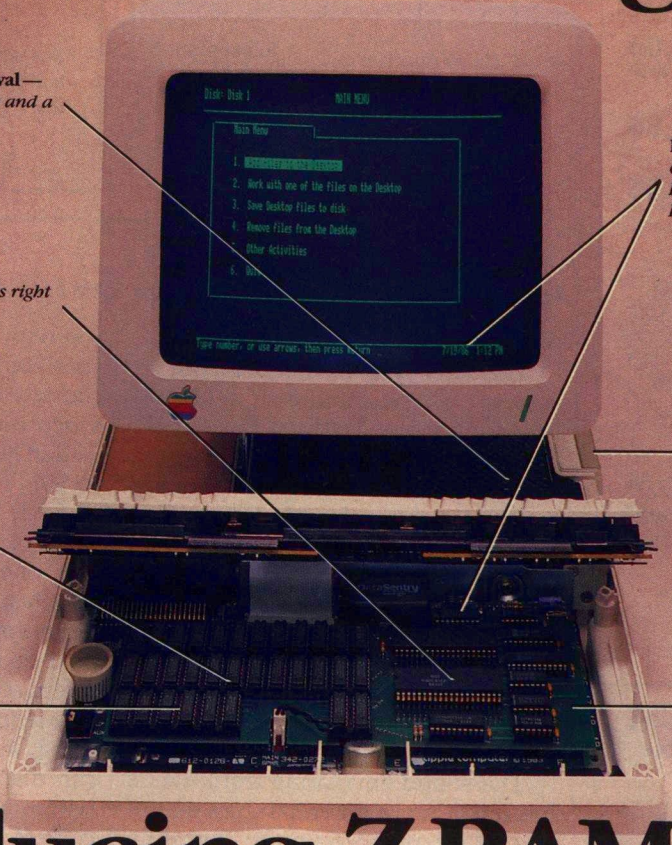

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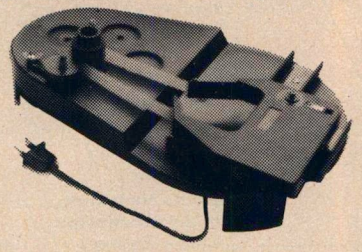

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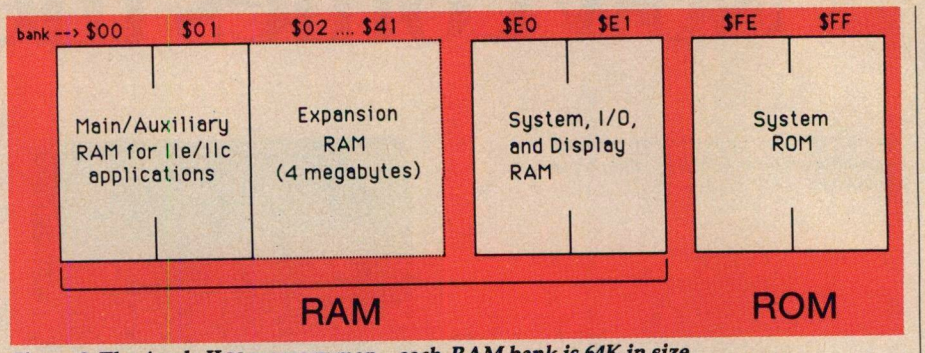


*Figure 2: The Apple IIGS memory map—each RAM bank is 64K in size.*

### Apple Desktop Bus

The keyboard connects to the GS through a new intelligent I/O port called the Apple Desktop Bus (ADB). The ADB lets you daisy-chain the keyboard and a variety of pointing devices, such as the GS mouse. The daisy-chain connector is on the side of the keyboard. Apple has published the software and hardware protocol for the ADB, so I suspect we'll soon be seeing devices such as graphics tablets, trackballs, and light pens for connection to the ADB.

### Sound

The sound emanating from the GS has much more potential than that of any other microcomputer currently on the market. The GS's sound chip is called the Ensoniq DOC (Digital Oscillator Chip) and is the same chip the Mirage music synthesizer uses.

The Ensoniq has 32 waveform oscillators, two of which are reserved for internal timing. The remaining 30 oscillators are paired off to form 15 independent sound generators or voices. Every voice can "sing" any waveform you like, at a specified volume and tempo, so you can generate complex sound effects or music.

### Clock

A real-time clock is built into the GS. It is battery-operated, so it keeps time even when the GS is turned off. A nice feature of the clock is that it does not use up an I/O slot or port, as it usually does when you add a clock card to the IIe. A new version of ProDOS for IIe-style applications (the successor to version 1.1.1) installs a driver for the clock as soon as it senses it is running on a GS.

### Super-High-Resolution Graphics

The GS provides all the video-display modes of the IIe and IIc, in addition to two new color-display modes, called super-high-resolution graphics, with these pixel dimensions: 320 (horizontal) by 200 (vertical) and 640 (horizontal) by 200 (vertical). The video buffer for both these modes is 32K in size and is located from $2000 to $9FFF in bank $E1.

Each horizontal line on the super-hi-res screen can be associated with any one of 16 user-definable color palettes, each of which contains the definitions of 16 colors that can appear on the line. Thus, up to 256 different colors can appear on the screen at one time, but with clever programming, using scan-line interrupts, you can display many more. Every color within a palette is defined by a 12-bit code (4 bits for red, 4 bits for green, 4 bits for blue), meaning it can be one of 4096 different colors. That should provide enough variety to keep game designers and artists happy for quite a while!

In the 320 × 200 mode, you can assign any of the 16 colors in a palette to a pixel on the line. Each pixel is defined by four data bits containing the color number within the palette. The 640 × 200 mode is more restrictive, however—only 4 of the 16 colors in the palette can be assigned to a pixel (two bits per pixel). Which 4 of the 16 are available depends on the horizontal position of the pixel.

### ProDOS Operating System

There are two versions of ProDOS you can use with the GS; the one you use depends on the type of application you're running. Standard ProDOS, the one that works on the entire Apple II line, is now called ProDOS 8 and must be used with IIe-style applications. ProDOS 16 works with applications that run in the 65816 native mode, so it runs on the GS only. The fundamental difference between ProDOS 16 and ProDOS 8 is that a program can execute ProDOS

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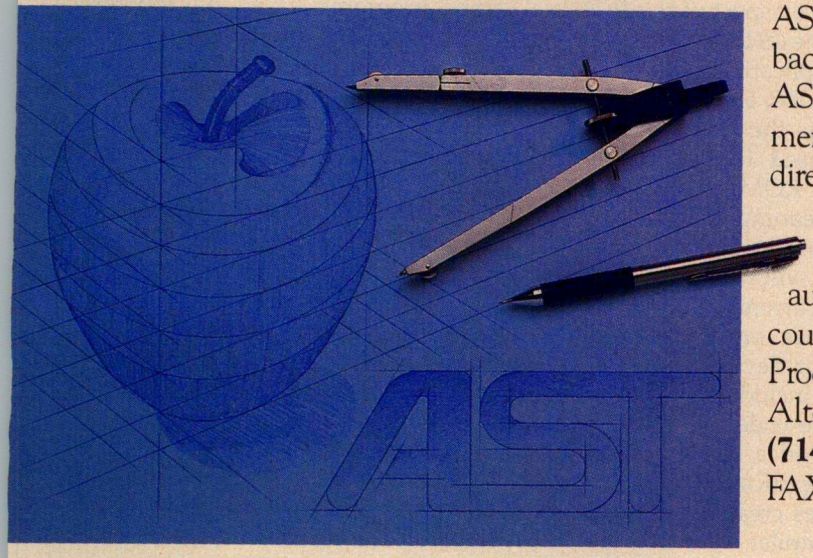


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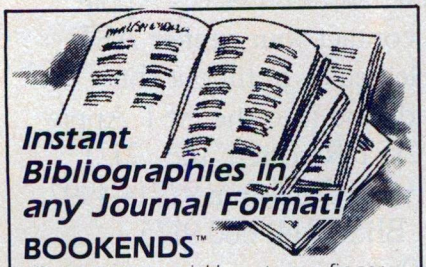

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16 commands from anywhere in the 16-megabyte memory space and can perform I/O transfers anywhere in memory. ProDOS 8, on the other hand, works only in the lowest 64K of memory.

### Software Tools

Apple has made it clear it would like GS-specific applications to use the desktop metaphor the Macintosh has popularized. To this end, it has created a Macintosh-like toolbox of standard subroutines that programmers can use to easily create windows, pull-down menus, dialog boxes, and other user-interface trappings on the super-hi-res screen. The core group of drawing routines is called—what else?—QuickDraw II. See the book excerpt "What's in the Toolbox?" in this issue for more information on this aspect of the IIGS.

Many of the GS tool sets are located in ROM; application programs load others from disk as they need them. Eventually, as the tool sets stabilize, the RAM-based tool sets will find their way to ROM, as they have on the Mac, meaning that more RAM space will be available for applications, which will run more quickly.

Apple is currently putting the finishing touches on a Programmer's Workshop for developers of GS software. It will include an editor for creating source-code files, a 65816 assembler, and a linker for creating executable applications from object-code modules created by the assembler or a compiler.

Apple intends to release two high-level-language compilers—C and Pascal—for the GS Programmer's Workshop. When I wrote this article (in early August), however, both were still in development, and all I had seen was some preliminary documentation for C. Strangely enough, Apple does not appear to be working on a compiled BASIC for the GS—perhaps we'll see one from an independent publisher instead. You can still use Applesoft, of course, but it won't take advantage of any of the new features of the GS, including the extra memory space.

### The Future of the GS

The GS will be attractive to those who love flashy graphics and symphonic sound, at least once some good software that exploits these features becomes available. It still makes sense to buy the GS in the meantime, however, because it runs existing software about 2½ times faster than the IIe does, it has a better keyboard, and it has built-in I/O ports and expansion slots.

I do not expect to see developers of business and productivity software stampeding to use QuickDraw II and the user-interface tools to create Macintosh-like applications on the GS. The reason is simple: Text-screen operations are much faster than graphics operations, and users want speed. The speed differential is particularly great for applications, such as word-processing programs and communications programs, that frequently update and scroll the screen.

Ease of use is not really an issue, since programs based on the text-based file-card metaphor, such as AppleWorks, have proven to be just as easy to learn as those based on the Macintosh desktop metaphor. Obviously, some business applications will use the super-hi-res graphics screen; they include charting and drawing programs, database programs that work with images rather than text, and word-processing programs that display text as it will appear when printed. Just don't expect them to run as quickly as the equivalent programs on the Macintosh do.

I expect to see, very soon, new versions of the classic text-screen-based business applications we already have on the IIe and IIc, rewritten to take advantage of the extra memory the GS offers. They will probably work with the mouse as well, because it is standard equipment on the GS. ✚

---


*Gary Little practices computer law in Vancouver, British Columbia, and enjoys writing about Apple computers in his spare time. His next book,* Exploring the Apple IIGS, *will be published by Addison-Wesley in early 1987.*


## REFERENCES


Eyes, D., and R. Lichty. *Programming the 65816, Including the 6502, 65C02 and 65802.* Prentice-Hall Press, 1986.

Fischer, M. *65816/65802 Assembly Language Programming.* Osborne/McGraw-Hill, 1986.

Labiak, William. *Programming the 65816.* Sybex, 1986.

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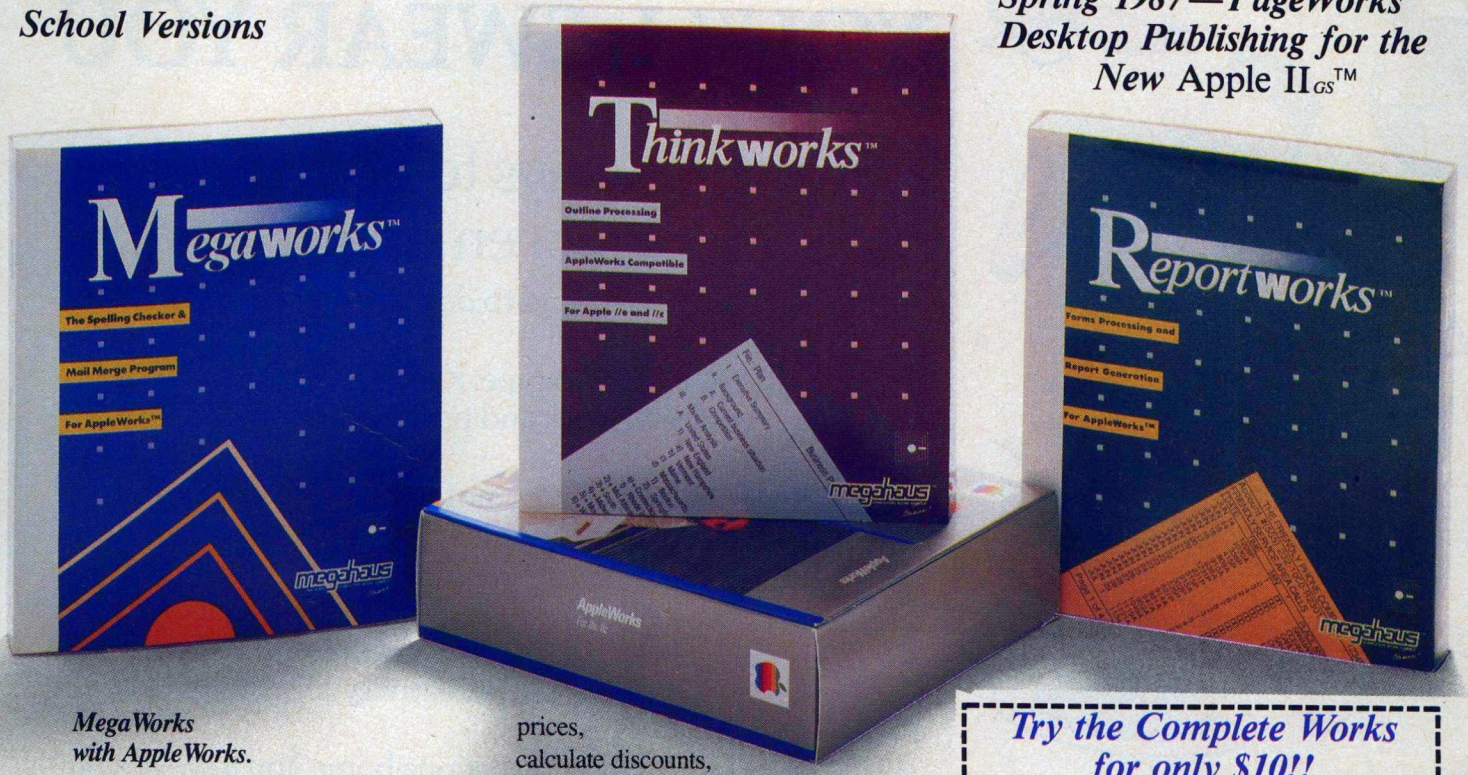


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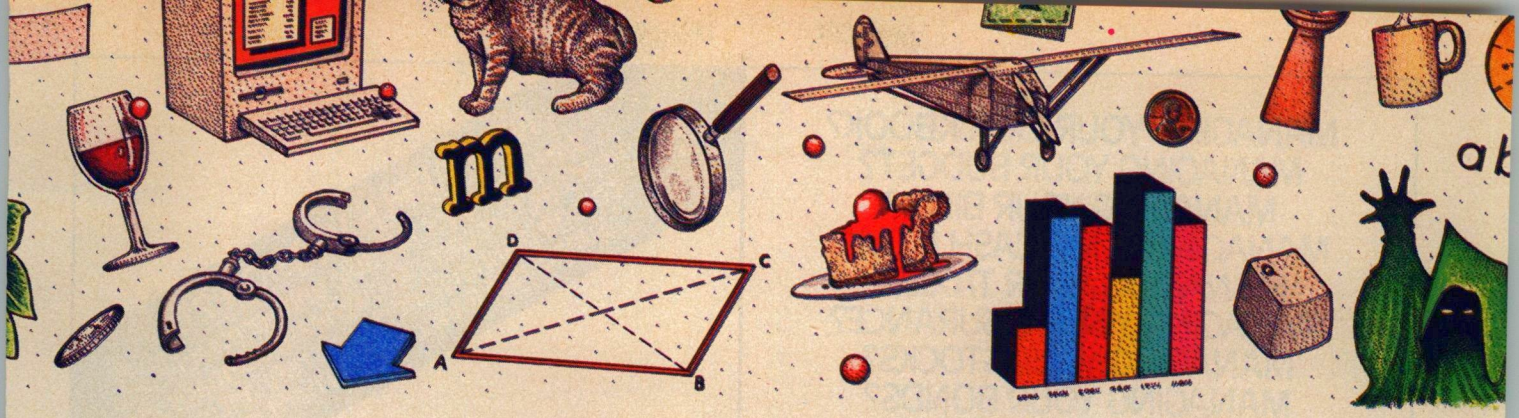

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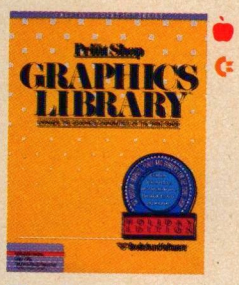


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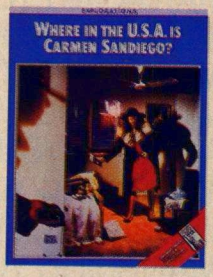


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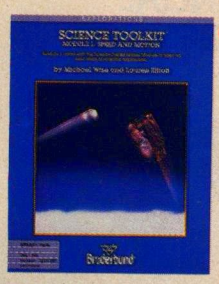


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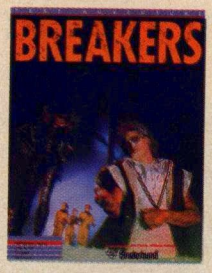


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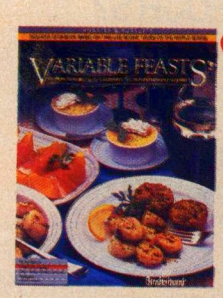


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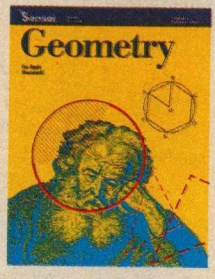


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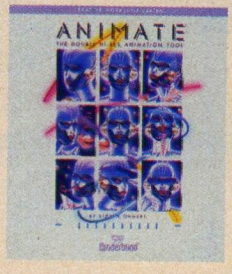


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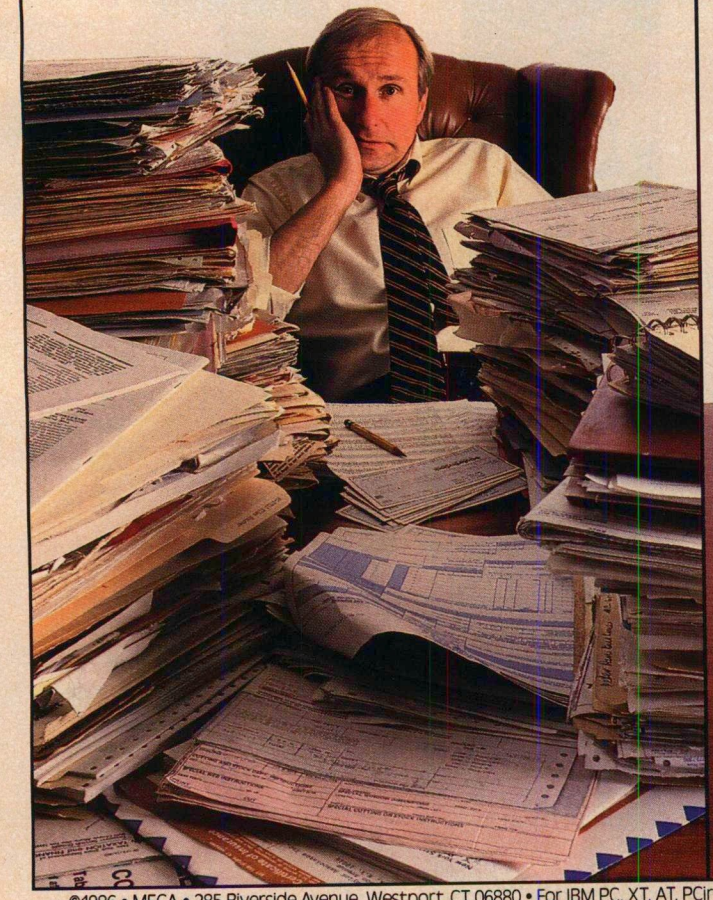

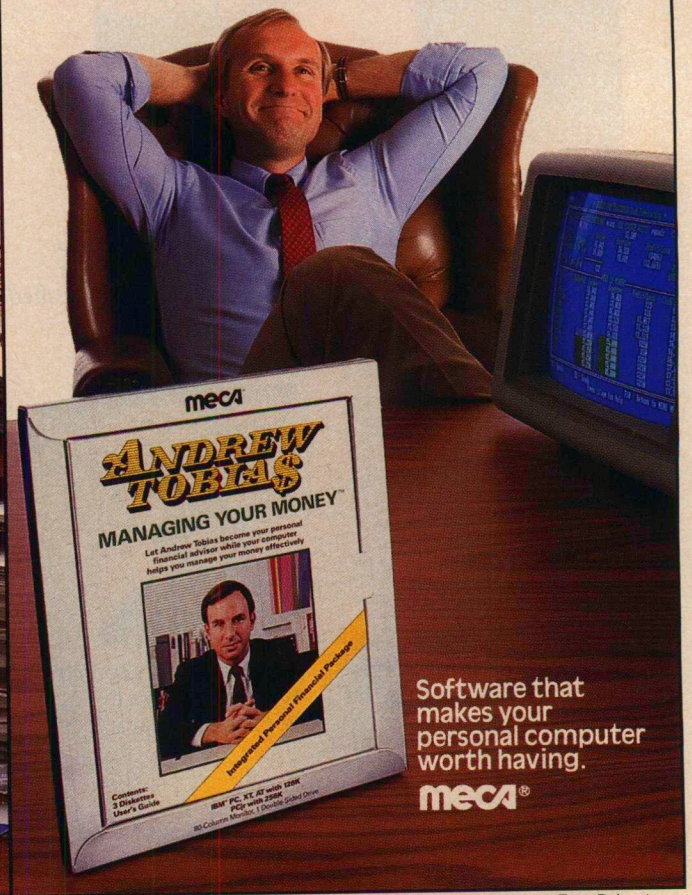


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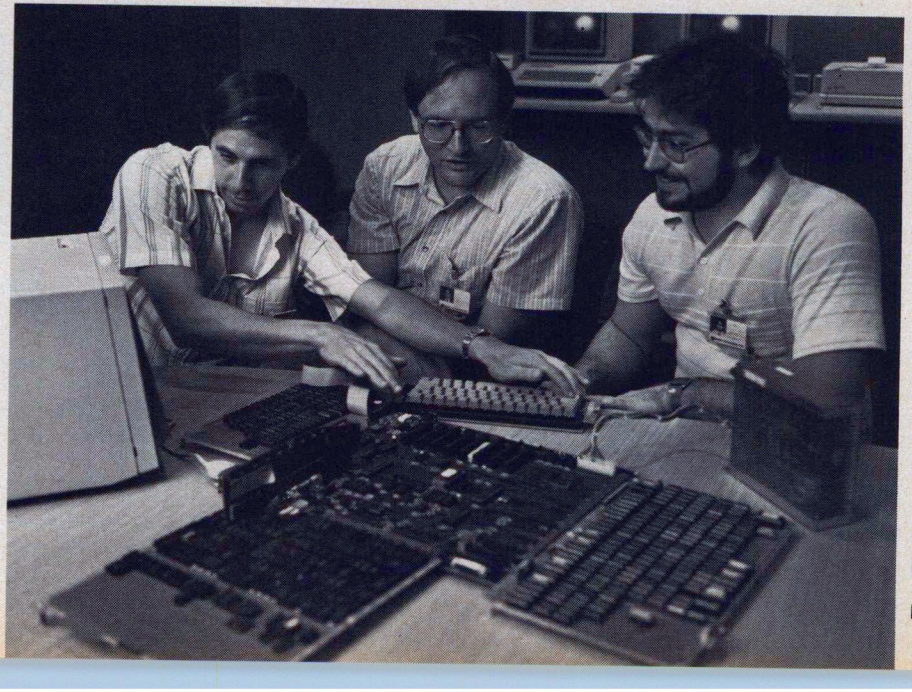

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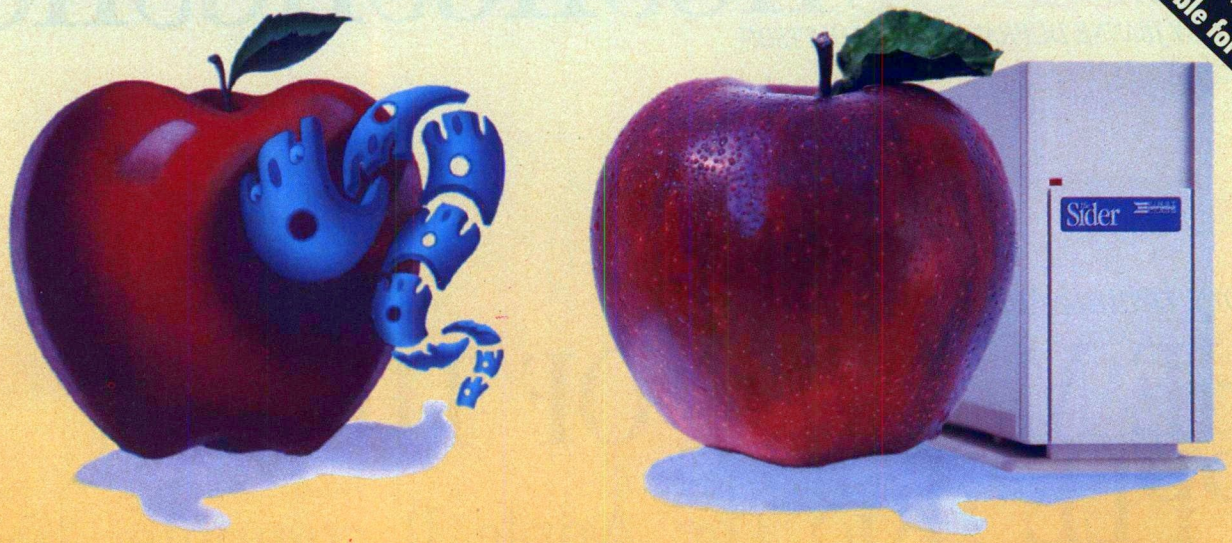


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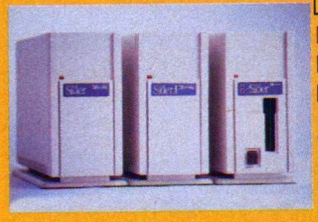

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the new machine in just the same way as you did on the old one. This family resemblance makes the Apple IIGS seem comfortable, familiar. But there's another side to its personality. High speed, spectacular color and sound, and the new mouse interface give it a flash and power that previous Apple II models can't approach. In themselves, these new features are probably reason enough to buy an Apple IIGS. But it's the combination of the old world and the new—which has been accomplished not absolutely seamlessly but still with amazingly few compromises—that makes the Apple IIGS unique.

**Linking Generations**

Two of the early code names for this second-generation Apple II were Brooklyn and Golden Gate. The new machine was going to be a bridge between the first generation of personal computers represented by the Apple II and the second generation represented by the Macintosh.

But the code name leaked to the press wasn't Brooklyn or Golden Gate; it was Apple IIx. The *x* stood for expanded, extended, extraordinary—no one knows for sure, but that was the name Steve Wozniak used when he discussed the next-generation Apple II with reporters and users' groups. It's not ordinarily Apple policy for employees to talk about products under development, but Wozniak was no ordinary employee (see figure 2). He was the cofounder of the company, the inventor of the original Apple II, and a subscriber to the hacker ethic that information was for sharing.

That ethic had certainly paid off with the Apple II. When the original Apple was under development, Wozniak reported every new feature he came up with to his friends at monthly meetings of the Homebrew computer club, and this inspired the development of thousands of programs and hundreds of peripherals for the new machine. Before Apple computers were available in stores, Wozniak would even go over to people's houses and help them build their own versions of his invention.

Wozniak took a break from Apple in 1981. He had stuck around long enough to help the Apple II become the Apple II Plus and to see the company grow from a start-up to a Fortune 500 company, but he wanted to finish his bachelor's degree at Berkeley. He had planned to be gone from Apple for only a year—just long enough to get his diploma—but he got sidetracked sponsoring a couple of rock concerts. By the time he returned, it was 1983, and Apple was a different place.

Apple was divided into product divisions by then—one working on the Lisa (a very expensive, very innovative computer that pioneered the mouse-based interface for personal computers), one working on the Macintosh (the computer that would offer Lisa technology at a more affordable price), and one working on variations of the Apple II. Steve Jobs and Wozniak's closest friends were all in the Macintosh group by this time, but Wozniak returned to the Apple II division, where he thought he could be the most useful.

***Figure 1: The Apple IIGS. While it has a comfortable resemblance to the rest of the II family, some new features give it a flash and power that previous Apple II models can't approach.***

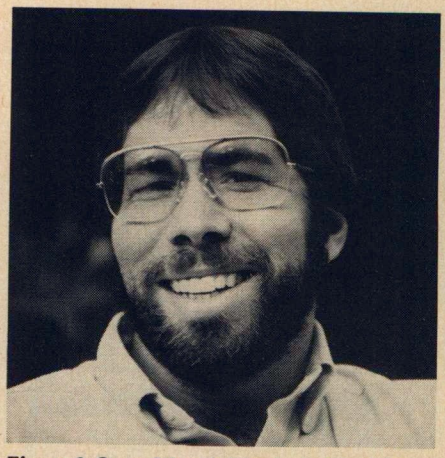


***Figure 2: Steve Wozniak, cofounder of Apple Computer, Inc.; inventor of the Apple II; and one of the Apple IIx's engineers***

"I don't think Steve Jobs or John Sculley [Apple's president] even knew I was back for a few weeks," says Wozniak. "I went straight to Dave Paterson, who was head of Apple II engineering, and asked if he needed another engineer." Paterson referred the overqualified engineering job applicant to engineering manager Dan Hillman, who would soon head up the hardware effort on the Apple IIx project.

"Wozniak was absolutely clear that he wanted to be treated like just another engineer," Hillman recalls. "He wanted to be paid like another engineer, he wanted an office just like another engineer, everything like another engineer. So I called up human resources and said, 'We have a real dilemma here. I have to hire the founder of our company. I'm not sure what salary to offer him, and I'm not sure what position to put him in, and does he get stock options?' "

So Wozniak helped with the Apple IIx and talked to users' groups about the Apple IIx, which generated a lot of interest in the IIx outside Apple. But the project never caught on inside Apple. In hindsight, the trouble with the Apple IIx was that it was trying to be too many things to too many people, and no one was trying very hard to make it an Apple II. Almost all of the marketing interest and engineering effort focused on putting a coprocessor slot into the machine that would let it run software designed for

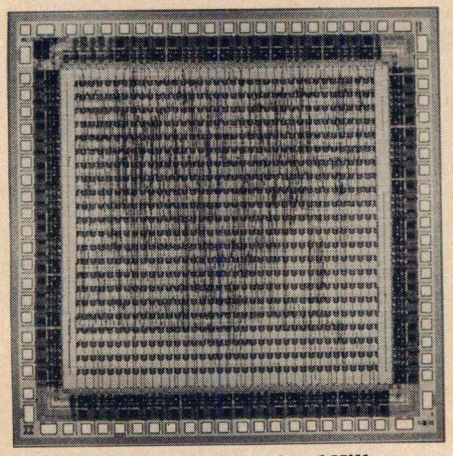


*Figure 3: Engineers Rickard and Hillman figured out a way to put almost the whole Apple II on this single chip, the Mega II.*

the Macintosh or for the IBM PC. (A coprocessor is a card containing the processor from another kind of computer. By using the power and memory of the host computer, a coprocessor gives you two computers in one.) To the executive staff, the IIx was an insurance policy. If the Macintosh didn't work out, Apple would have an alternative machine to position against the IBM PC.

As it turned out, the Macintosh didn't need a pinch hitter, and the 65816 processor chip fell behind schedule. So no one was surprised when the Brooklyn/Golden Gate project came falling down like one bridge it wasn't code-named after. In fact, the team leaders were the ones who suggested to the executive staff that the project be canceled.

For six months after that, there was no more talk about a 16-bit Apple II, and Hillman was reassigned to a more mundane task—reducing the cost of the Apple II. He and engineer Jay Rickard reduced its cost all right. They figured out a way to put almost the whole Apple II on a single chip called the Mega II (see figure 3).

"When we designed the Mega II, we didn't know what the machine was for," Hillman recalls, "but all the talk then was about the Apple IIc. At that time, the Mega II just seemed like a way to make the Apple IIc smaller."

**Return of the Apple IIx**

What brought the IIx back to life? Partly it was the 65816, which was finally ready, but mostly it was Apple II sales. The introduction of the Apple IIc in April 1984, with its marketing message "Apple II Forever," had revived interest in the whole Apple II product line, and Apple II sales were going through the roof. "They priced the IIe below the IIc, so it wasn't clear if people wanted an open Apple II or the cheaper Apple II," says Hillman, "but it was clear that the open system didn't scare them." Maybe there was a market for a high-end, expandable Apple II after all.

Hillman was at a meeting waiting to hear whether the Mega II would be used to reduce the cost of the Apple IIe or the Apple IIc when Wozniak suggested reviving the 16-bit Apple II project. "My first reaction," says Hillman, "was 'Oh God, I think I've been through this before.' " There was no arguing with Apple II sales, though, so the IIx rose from the ashes with the code name Phoenix.

Hillman had learned a lesson from the original IIx project and from Apple II sales. This time the emphasis was on the II-ness of the machine, not just the new-ness.

The first few planning meetings involved Wozniak, Hillman, Harvey Lehtman from the system software group, and Lee Collings from marketing (see figure 4).

Collings is not your typical marketing type. "He's more of an honorary engineer," says Lehtman. Collings was managing a hi-fi shop when he saw his first Apple II in 1978. That particular Apple II was serial #5, and it came with a photocopied manual in a loose-leaf binder. "Most of it was typed," Collings recalls, "except for some notes about hires graphics that Wozniak had written in by hand."

Collings joined Apple in 1979 to do dealer sales support and later marketing, but he was always a hacker at heart. "I still have all the old BASIC programs I wrote," he says. "They're on disks now, but they were on cassette tape when I first wrote them."

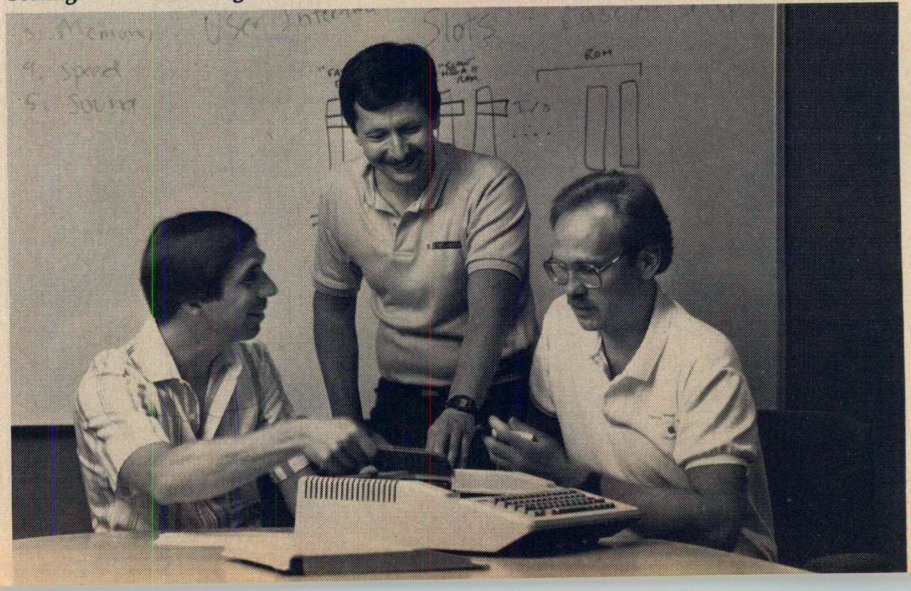
Collings drew on his intimate and long-term relationship with the Apple II in preparing the Apple IIGS's marketing requirement document (MRD)—the wish list that is marketing's contribution to the development of a new product. "The basis of that document," he says, "was what I wanted in an Apple II. Having lived with the II, the II Plus, the IIe, and the IIc, I knew what I wanted, and I knew what a lot of my friends wanted, so I just put it down on paper."

But Hillman wanted something more basic than an MRD. He wanted a mission. "I told them I'd build anything they wanted no matter how crazy it was," says Hillman. "But I had to have a mission."

**The Hardware Mission**

"Our mission was very simple," says Hillman. "First, we wanted to preserve the Apple II as it exists today. It had to work with Apple IIe software and Apple IIc software. That was goal number 1. But we recognized that the Apple II was an old computer. It had limitations. The new machine needed to address those limitations, break through those barriers—and the barriers were very obvious: We needed to increase the

*Figure 4: Engineer Dan Hillman, Harvey Lehtman from the system-software group, and Lee Collings from marketing were involved in the first planning meetings for the IIGS.*



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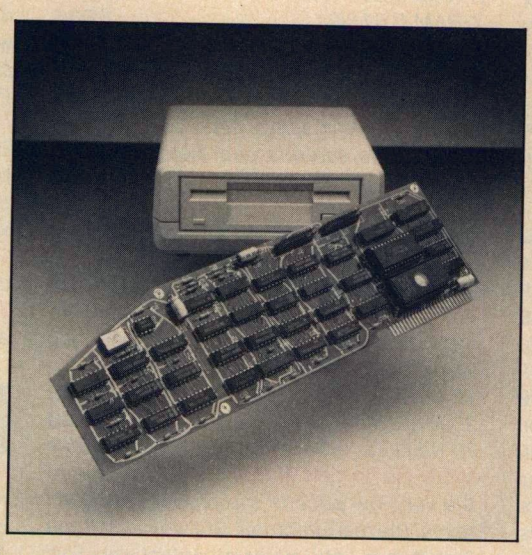

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memory size. We had to make it run faster. We needed better graphics. And we had to have better sound. That was our mission."

"We also wanted the Apple IIGS to be easy to set up, like the IIc, and easy to expand, like the IIe," Lehtman recalls. That created some interesting challenges for Lehtman's group because the ports on the IIc emulated particular slots on a IIe. With both ports and slots, peripherals would face some serious identity crises without clever intervention from the system software.

**Keeping it Simple**

Wozniak was heavily involved in designing the architecture of the Apple IIGS and adamant about keeping the design simple. "Woz likes to minimize headaches," explains Hillman. "He thinks that if you have to keep looking at a book to figure out what mode you're in, then it's too hard to use." In the interest of simplicity, he argued against putting a coprocessor into the Apple IIGS. "He thought it wrecked the architecture of the machine," says Hillman. And it was his idea to keep the 8-bit world totally separate from the 16-bit world. Rather than perpetuating the strange graphics modes and memory-addressing schemes that made sense in 1976 but not in 1986, he suggested that they rope off 128K of the 256K built into the machine and designate it as "slow RAM." Everything in slow RAM would work the way it did on earlier Apple II computers. The other 128K and the memory on the memory-expansion card would be fast, clean, and efficient.

"Woz came in and drew it all up on the board in about two minutes," Hillman recalls. "It looked like a real mess, but it was very clear in my mind."

Laura Basso Roebuck, the group's secretary, came in, took one look at the board and said, "What's that?" "That," said Hillman, "is the future of Apple Computer."

They hadn't solved the graphics problem yet, or the sound problem, but they'd figured out a way for new programs to use up a lot of memory (up to 16 megabytes) in a clean, efficient way without interfering with compatibility of old programs, and they figured out a way for new programs *and old programs* to run three times faster than they could on an Apple II-series computer. The key to all of this was a custom chip called the FPI, the Fast Processor Interface that would sit between the Mega II and the 65816 and route tasks to the appropriate chip.

Just when all the hardware pieces were starting to fall into place, Wozniak left Apple to start up a new company called CL9 (for Cloud 9). Wozniak concedes that his timing was strange, but he had become used to his life taking unexpected turns. Like his computer designs, Wozniak "likes to be flexible."

"I credit Woz a lot on the initial design of this product," says Hillman. "He helped design the architecture, then—poof—he disappeared. He got interested in this little remote-control device, and that appealed to him more than slogging through the mess of getting a computer out."

"The Apple IIGS's design was beautiful," says Wozniak, "but I had gotten turned on to a couple of projects that weren't computers. The big word at Apple then was 'productivity, productivity, productivity.' Everything was being sold as a productivity tool. Well, I don't think you have to be productive all the time. I wanted to work on nonproductivity products including video editing systems and a little remote-control thing. I wanted to do those things, and I had to leave Apple to do them, but I was very happy with the Apple IIGS and with the product definition and with the people working on it."

**Solving the Graphics Problem**

If old-timer Wozniak was instrumental in solving the memory-addressing problem, it was newcomer Rob Moore who solved the graphics problem. The resolution they were shooting for was 640 × 200 in the 4-color mode and 320 × 200 in the 16-color mode. Those are the number of dots, or pixels, that make up a very-high-resolution video display. The more pixels, the sharper the picture.


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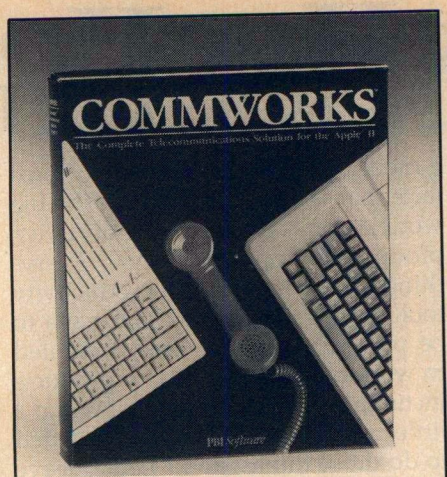


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The competition was doing 640 × 200 and 320 × 200, and that's what the 16-bit Apple II had to do, as well as maintain compatibility with all the earlier graphics modes.

Actually, the Amiga from Commodore and the Atari ST were boasting a 640 × 400 display, and that's what Collings was pushing for. "I got shot down on that one," says Collings, "but for a good reason."

"Commodore gets a horizontal resolution of 400 lines using a technique called interlacing," Lehtman explains. "We chose not to do that because interlacing requires a special slow-phosphor monitor, which is rather expensive, or else you get a lot of flicker. Going with the 640 × 200 was a very deliberate choice."

*In some ways sound was the easiest problem to solve, but it became one of the most controversial features of the new machine.*

So they aimed for a maximum resolution of 640 × 200, and it was Moore who figured out a way to get it. Moore was new to Apple the company, but he was an old hand with Apple computers, "a real hacker," says Hillman. "An Apple II guy all the way." Moore was assigned to the FPI chip, but he couldn't help trying to solve the graphics problem.

"Our goal was that the graphics use linear addressing," says Hillman. Linear addressing means that there is a direct correlation between the location in memory that says what the pixel should do and the location of the pixel on the screen. It's a lot easier for programmers because it's more intuitive, but it takes up a lot more memory than what now seems like the odd graphics implementation Wozniak designed for the original Apple II.

Wozniak concedes that linear addressing makes more sense in today's machines, but he points out that his method wasn't odd for its time—there was no method at the time. "You have to remember that in 1975 there wasn't one single computer that had color in it. There was one color board, for S-100 computers, but you had to assemble those computers yourself, and the color board had more chips than the entire Apple II. I had to scramble to figure out a way to add color without adding costs. I feel sorry for the guys who have to keep it compatible. The trouble is that the environment changes. What made a whole new world possible in 1976 is clumsy to use in 1986."

Hillman was determined that they come up with linear addressing; to do that they needed to find a contiguous chunk of memory—32K—and they couldn't find that much in one location. They couldn't just move things around to make room because certain parts of memory were reserved for particular functions. Moore kept proposing solutions, and Hillman kept shooting them down.

Finally, Hillman recalls, they found 32K they could use, but it was in two chunks, not one. That's when Moore came up with the idea of using a custom chip, the Video Graphics Controller (VGC), to do a logical-to-physical translation and a memory-address rearrangement. From a programmer's point of view, the memory appears to be in one chunk, even though physically it's spread out over two areas. "The new Apple IIGS graphics modes are very clean and easy to use because of it," says Hillman, "but it's one of the most complicated chips we've got."

"The other graphics modes are still bizarre," adds Hillman. Which is to say that the Apple IIGS provides all of the earlier Apple II graphics modes as well as the two new clean ones. So old programs can still run on the new machine and look the way they always have.

**Sonic Controversy**

In some ways sound was the easiest problem to solve, but it became one of the most controversial features of the new machine. The original sound chip proposed for the Apple IIGS gave it arcade-quality sound. It was nothing special, but it was more or less what the competition was doing. Then Rob Moore proposed using the Ensoniq, a sound chip used in the

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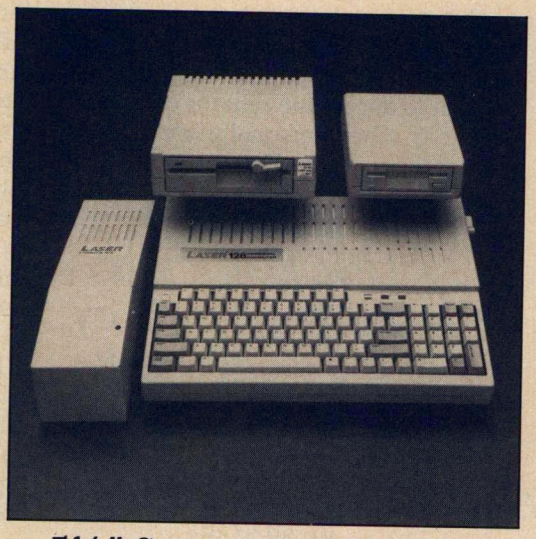

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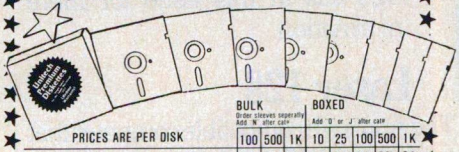

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Mirage music synthesizer. "Ensoniq sent the chip to Woz," Moore recalls. "He wasn't that interested in sound, so he passed it on to another engineer, who thought it was too complicated. But I went crazy over it. Computer music is a hobby of mine, and the chip did all the things I'd been trying to do with software all these years. I didn't have anything to do with designing the chip, but I was the official pain in the ass who made people appreciate what it could do."

No other personal computer had anything like the Ensoniq sound chip.

*'I told them it was an enabling technology, that it would enable people to do things they'd never dreamed of doing.'*

The danger in putting such a chip into your computer is that it can lead to typecasting as a game machine. (At that time, the only applications besides music-composition programs that used sound to advantage were games.)

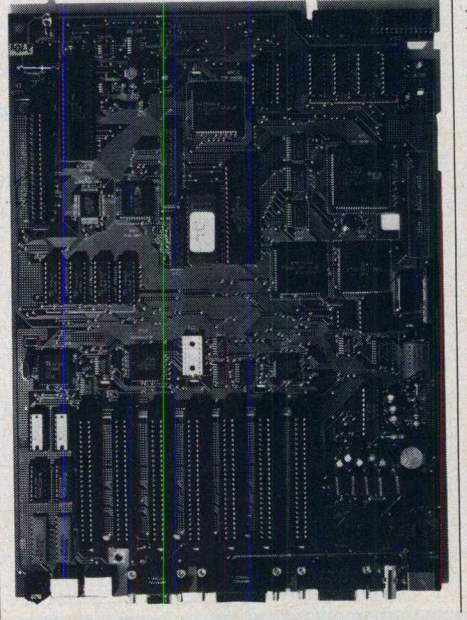
Hillman finally persuaded upper management to go with the Ensoniq sound chip by using a phrase borrowed from the Macintosh marketing phrase book. "I told them it was an *enabling technology*, that it would enable people to do things they'd never dreamed of doing."

According to product manager Chris Sasaki, whose job it is to dream of new products and programs, a lot of innovative sound applications are already in the works. "Imagine a program that comes with a children's storybook," he says. "You read the story; then you start up the disk, and the characters you were just reading about are talking to you. I've already seen a demo of a program like that."

For older students, says Sasaki, programs on CD-ROMs will let you hear information stored in a database while you're reading it on the screen. "Let's say you want to find out what Kennedy said in a certain speech. Instead of just seeing the speech displayed on the screen, you can hear it spoken." And because of the sophistication of the sound chip, it will sound like Kennedy's own voice speaking, not like "a drunken Scandinavian trapped in an oil drum," as someone once described early attempts at speech synthesis.

Sasaki also anticipates interesting business applications for the sound chip—voice mail, for example. "Someone will be able to call you up and leave a message, and the message will be automatically digitized and stored on a disk with the time and date of the call."

***Figure 5: The Apple IIGS circuit board***



**Mission Accomplished**

With the sound issue resolved, the members of the hardware group had more than fulfilled their mission. They had maintained compatibility, boosted the memory beyond four megabytes, sped up the processor, improved the graphics, and leapfrogged the competition in sound. They'd also added a built-in clock, made room on the circuit board for seven general-purpose expansion slots, built in the equivalent of seven interface cards, and made it so you could tap those cards simply by plugging the device into the appropriate port on the back of the computer (see figure 5).

Once the hardware was defined, it was up to Harvey Lehtman's group to write the firmware, the programs in ROM that software developers would

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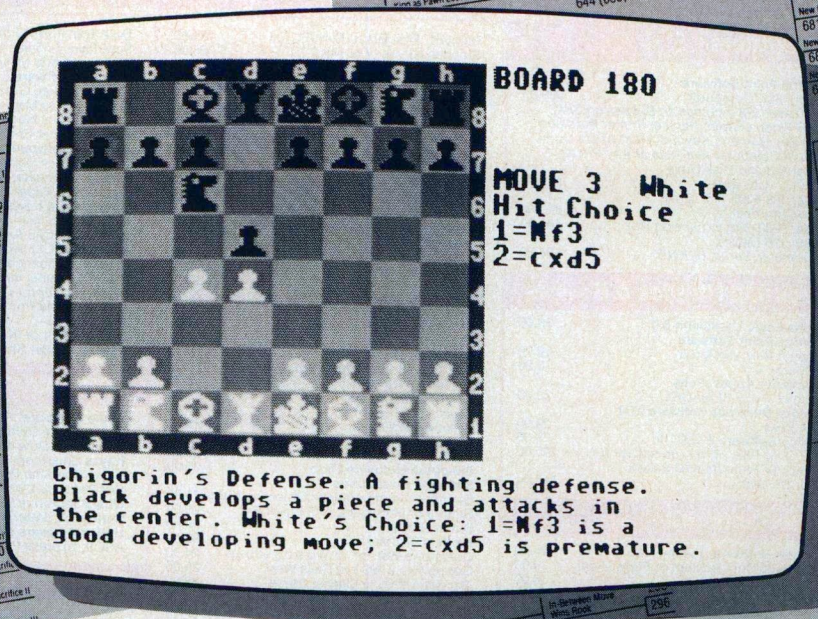


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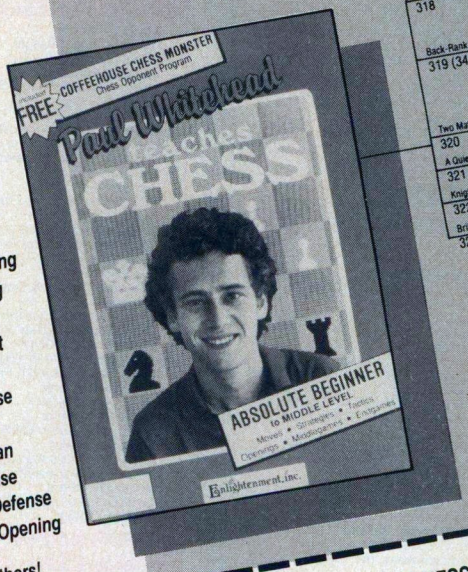


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Print Shop Graphics Library I, II, or III 16.00
Print Shop Paper Refill 12.95
**Data Transforms** Fontrix 1.5 54.00
Font Paks 1-15 ea. 14.00
**Electronic Arts** Movie Maker 27.00
**Penguin Software**
New Complete Graphics System 26.00
The Graphics Magician 26.00
The Graphics Magician Jr. 14.00
**Roger Wagner** Printographer 26.00
**Sensible Software**
The Graphics Department 67.00
**Simon & Schuster**
Great INTL Paper Airplane Const. Kit 25.00
**Springboard** Newsroom 35.00
Certificate Maker 30.00
Newsroom Clip Art Collection Vol. 1 18.00
Newsroom Clip Art Collection Vol. 2 25.00
Graphics Expander Vol. 1 25.00
**T & W Systems, Inc.**
CadApple *(Entry-Level Cad)* 69.00
**Unison World** Printmaster 25.00
Art Gallery I 25.00
Art Gallery II or III 19.00
**Weekly Reader** Stickybear Printer 23.00

## Communications

**Apple Computer** Access *II (IIe, IIc only)* 62.00
**Compuserve** Compuserve Starter Kit 27.00
**Dow Jones** Dow Jones Membership Kit 22.00
**Hayes** Smartcom I 72.00
Hayes Terminal Pgm. *(Smartmodem)* 59.00
*PBI Software* Commworks (//e & //c) 65.00
**Quark** Terminus *IIe* 62.00
**Softronics** Softerm II 125.00
**United Software Industries**
ASCII: Express Pro: Prodos or Dos 3.3 75.00

## Business Software

**Advanced Logic Systems** SpellWorks 31.00
The Handlers *(II+, IIe, IIc)* 59.00
**Apple** Apple Works *(IIe, IIc)* 199.00
Apple Writer *II* 2.0 ProDos *(IIe, IIc)* 119.00
Quickfile *(IIe only)* 79.00
**Batteries Included** Paper Clip 38.00
**BPI Systems**
BPI General Accounting ProDos 219.00
BPI AR/AP/PR or Inv. ProDos (ea.) 219.00
**Broderbund**
Bank Street Writer *(IIe, IIc)* or Speller 44.00
Bank Street Filer *(128K)* or Mailer 44.00
**Dow Jones Software**
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**Good Software** Investor III 149.00
Amortizer III 56.00
**Haba/Arrays** Home Accountant 47.00
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AppleWorks Buddies 71.00
Habacalc 'N' Graph 42.00
Haba Speller or HabaMerge 29.00
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**Human Edge Software**
Communications or Management Edge 57.00
Mind Prober 28.00
Mind Over Minors 31.00
Sales or Negotiation Edge 57.00
**Intuit** Quicken 49.00
**Living Videotext**
Think Tank V1.1 *(II+ or IIe)* 79.00
**Manzanita**
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Payroll Module 279.00
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System Manager *(Required)* 65.00
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Payroll Module 225.00
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Payroll Module 279.00
**MECA** Managing Your Money 119.00
**Megahaus** MegaWorks 79.00
ReportWorks 79.00
Thinkworks 79.00
**Monogram** Dollars and Sense *(II+, //e or //c)* 72.00
Forecast *(64K or 128K)* 38.00
**Nolo Press** Will Writer *(Version 2.0)* 29.00
**PBI Software** Graphworks 1.3 45.00
Jeeves 29.00
**Peachtree**
Back To Basics Accounting System: *GL/AR/AP* 99.00
Back To Basics GL, AP, AR 52.00
**Personal Choice Software**
Filler's Choice 35.00
Personal Choice Collection 75.00
Planner's Choice 35.00
Writer's Choice 35.00
**Pinpoint Publishing** Pinpoint 49.00
PinPoint Spelling Checker 39.00
PinPoint Document Checker 39.00
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Point To Point 75.00
Infomerge 52.00
RunRun 28.00
Pinpoint //e Upgrade Kit 23.00
PinPoint Ram Enhancement 23.00
PinPoint Modem Enhancement 23.00
**PM Software**
ProFILER 2.1 69.00
**Professional Software** Fleet System 3 49.00
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**Quark** Catalyst //e V3.0 59.00
Word Juggler & Lexicheck //e 59.00
**Roger Wagner Publishing**
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The Write Choice 42.00
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Sensible Grammer ProDos 56.00
Sensible Speller-Dos or ProDos 69.00
**Sierra On-Line** Smart Money 52.00
Homeword Plus *(128K) w/Speller* 45.00
**Simon & Schuster**
JK Lasser's Income Tax 45.00
Webster's Spelling Checker *(ProDos)* 38.00
**Software Publishing**
*All Programs for //e with 128K or //c*
PFS: Workmates *(File/Report/Plan/Write)* 149.00
PFS: Graph 76.00
PFS: File/Report Bundle 76.00
PFS: Write or Plan *(//e, //c)* 76.00
**Sorcim/IUS** SuperCalc 3a 105.00
**Style Ware** Multiscribe 46.00
**Timeworks**
Sylvia Porter's Financial Planner 62.00
**VIP Software** VIP Professional *(Lotus 1-2-3 Work-Alike)* 145.00
**Word Perfect Corporation**
WordPerfect V1.1 *(//e & //c)* 85.00

## Educational Software

**Addison Wesley** Smart Eyes 38.00
**Apple** Apple Logo // 128K *(//e, //c only)* 85.00
**Bantam Software**
Fantastic Animals or Road Rally USA 25.00
Creative Contraptions 25.00
**Barron's** Computer SAT Revised Version 32.00
**Baudville** Guitar Wizard 18.00
Ted Bear Discovers...Rainy Day Games 18.00
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Homework Helpers: Math Word Problems 32.00
Homework Helpers: Writing 32.00
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Speed Reader Data A, B, D, or D 11.95
Spell-It or Word Attack! 28.00
**Designware**
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Remember 49.00
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The Body Transparent 29.00
**Fisher Price** Alpha Build or Logic Levels 16.00
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**Grolier Publishing** EduCalc 32.00
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Computer SAT 49.00
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Intracourse Analysis & Compatibility Module 59.00
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**Randam House** Charlie Brown's ABC's 20.00
Charlie Brown Typing is a Ball 20.00
Garfield Double Dares 20.00
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Snoopy Writer or Fix-It 20.00
**Sensible Software** Report Card 34.00
**Scarborough Systems**
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MasterType's Writer *(5¼" or 3½")* 45.00
MasterType's Filer 25.00
**Scholastic Wizware**
Agent U.S.A. 25.00
Math Shop 31.00
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Microzine 1 23.00
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| | |
|---|---|
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## Modems

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|---|---|
| **Anchor Automation** | |
| Signalman Express 1200 | 235.00 |
| Signalman Lightning 2400 | 355.00 |
| Volksmodem 12 | 179.00 |
| **Hayes** Hayes Micromodem //e | 139.00 |
| Hayes 300 Baud Smartmodem //c | 159.00 |
| Hayes 300 Baud Smartmodem | 139.00 |
| Hayes 1200 Baud Smartmodem | 369.00 |
| Hayes 2400 Baud Smartmodem | 579.00 |
| Transet 1000 | 269.00 |
| **Novation** Novation Apple Cat II | 189.00 |
| Novation 212 Apple Cat II | 355.00 |
| Novation 212 Upgrade | 219.00 |
| Novation 2400 Baud External | 479.00 |
| **Prometheus** | |
| Pro Modem 1200 *(External)* | 279.00 |
| ProModem 1200G *(Non Expandable)* | 199.00 |
| Pro Modem 1200A *(Internal)* | 249.00 |
| Pro Modem 300c | 89.00 |
| Options Processor or Alphanumeric Display | 69.00 |
| **U.S. Robotics** | |
| U.S. Robotics Password 1200 | 199.00 |
| U.S. Robotics Courier 2400 | 399.00 |
| **Zoom Telephonics** Zoom/Modem //e | 105.00 |
| Zoom/Modem //e Plus | 115.00 |

## Accelerators/Ramcards Z-80/80 Col.

| | |
|---|---|
| **Advanced Logic Systems** | |
| Add-Ram 16 | 65.00 |
| Add-Ram 80/64 | 52.00 |
| **Apple Computer** | |
| Apple II Memory Expansion Card | 225.00 |
| Apple //e Extended 80 Col. Card | 89.00 |
| Apple //e Enhancement Kit | 45.00 |
| **Applied Engineering** | |
| RamWorks III *(64K to 3 MB)* | Call |
| RamFactor *(256K to 1MB)* | Call |
| Phasor *(II+ or IIe)* | 215.00 |
| Z-RAM //c *(256 or 512K)* | Call |
| Ramworks RGB Option & 16 Bit Option | Call |
| TransWarp Accelerator | Call |
| TransWarp 16 Bit Upgrade | Call |
| ViewMaster 80 | 109.00 |
| Z-80 Plus | 109.00 |
| **Apricorn** Apricorn 64K Extend-It | 75.00 |
| Apricorn 16K Ramcard II+ | 79.00 |
| **AST Research** | |
| MegaRamPlus w/64K | 125.00 |
| MegaRamPlus w/256K | 179.00 |
| SprintDisk w/256K | 189.00 |
| SprintDisk w/512K | 269.00 |
| **Checkmate Technology** | |
| MultiRam CX *(256K)* | 149.00 |
| MultiRam CX *(512K)* | 189.00 |
| MultiRam CX-*Piggyback (000K)* | 199.00 |
| MultiRam CX-*Piggyback (256K)* | 219.00 |
| MultiRam CX-*Piggyback (512K)* | 229.00 |
| MultiRam *//e (128K)* | 129.00 |
| MultiRam //e RGB *(128K)* | 159.00 |
| MultiRam *//e (256K)* | 149.00 |
| MultiRam //e RGB *(256K)* | 179.00 |
| MultiRam *//e (512K)* | 179.00 |
| MultiRam //e RGB *(512K)* | 225.00 |
| Zee-80A | 55.00 |
| **Information Appliance** SwyftCard | 69.00 |
| **Micro Sci** Micro Sci 80/64e | 69.00 |
| **MCT** MCT Speed Demon | 155.00 |
| **Titan Industries** Saturn 128K Ram Accelerator //e | 175.00<br>219.00 |

## Multifunction Cards

| | |
|---|---|
| **AST Research** | |
| Multi I/O Clock/Calendar | 99.00 |
| Multi I/O Clock/Calendar/2 Ser. Ports | 139.00 |
| **Prometheus** VERSAcard | 129.00 |
| **Quadram** Multicore w/0K | 149.00 |
| Multicore w/256K | 179.00 |
| *Specify Apple Or IBM RGB Cable:* | |
| Extended Multifunction Board (64K) | 159.00 |
| Extended Multifunction Board w/RGB | 189.00 |
| RGB Upgrade *(Apple or IBM RGB)* | 45.00 |
| **Street Electronics** | |
| Business Card Parallel | 179.00 |
| Business Card Serial | 159.00 |

## Printer Interface Cards

| | |
|---|---|
| **Apple** Apple Super Serial Card | 115.00 |
| **Apricorn** Apricord //c | 54.00 |
| Super Serial Card | 92.00 |
| **Orange Micro** Serial Grappler Plus | 75.00 |
| Grappler+ | 75.00 |
| Buffered Grappler+ | 119.00 |
| Grappler //c | 79.00 |
| Imagebuffer 64K *(For Imagewriter II Printer)* | 69.00 |
| Hot Link | 49.00 |
| **Quadram** | |
| APIC Parallel Interface with Cable | 69.00 |
| APIC C/G Parallel Interface w/Color Gr. | 75.00 |
| Serial Interface *(AB-400)* | 71.00 |
| Buffered Serial Interface *(64K)* | 109.00 |
| **TextPrint** Print-It! (Parallel or Serial) | 132.00 |
| **Thirdware** *Choice of Parallel, Serial (ImageWriter I), or Serial (ImageWriter II)* | |
| Finger Print Plus II+, //e, //c | 89.00 |

## Clock/Calendar Peripherals

| | |
|---|---|
| **Applied Engineering** | |
| TimeMaster H.O. | 99.00 |
| BSR Interface | 39.00 |
| //c System Clock | 65.00 |
| **Quadram** | |
| Pro Dos Clock/Calendar Card | 62.00 |
| **Creative Peripherals** | |
| Seiko Datagraph 2001 w/Time Trax (//e or //c) | 149.00 |
| //c System CLock | 55.00 |
| **Street Electronics** Livewire | 70.00 |
| **Thunderware** Thunderclock Plus | 109.00 |
| **X-10 (USA) Inc.** | |
| X-10 Powerhouse Computer Interface | 49.00 |
| X-10 Wall Switch Module | 18.00 |
| X-10 Lamp Module | 15.00 |
| X-10 Appliance Module | 15.00 |

## Video Cards

| | |
|---|---|
| **Video 7** | |
| Color Enhancer //e | 119.00 |
| Color Enhancer //c | 89.00 |
| Screen Enhancer //e | 89.00 |
| Screen Enhancer //c | 49.00 |

## Accessories

| | |
|---|---|
| Kensington System Saver | 59.00 |
| Cool + Time | 69.00 |
| Curtis Diamond | 30.00 |
| Curtis Emerald | 36.00 |
| Curtis Ruby | 54.00 |
| Curtis Sapphire | 47.00 |
| Apple Mouse //e | 119.00 |
| Apple Mouse //c | 89.00 |
| Pico Universal Joystick II+, //e, //c | 25.00 |
| Hayes Mach II Joystick | 29.00 |
| Hayes Mach III Joystick | 35.00 |
| Kraft Quickstick //c | 49.00 |
| Kraft Joystick Universal *(II+ //e, //c)* | 29.00 |
| Koala Pad Plus w/Graphics Exhibitor | 79.00 |
| Trackhouse Keypad *(//e Standard)* | 85.00 |
| Trackhouse Keypad *(//e Programmable)* | 139.00 |
| Mockingboard A Board | 75.00 |
| Mockingboard C Board | 119.00 |
| Echo II Plus | 99.00 |
| The Cricket //c | 82.00 |
| Rainbow Paper Pak *(300 Sheets)* | 12.00 |
| ImageWriter Ribbon-Black | 4.50 |
| ImageWriter Ribbon-Color | 5.00 |
| ImageWriter II Color Ribbon | 6.95 |
| ImageWriter Rainbow Pack (6 Colors) | 27.00 |
| *Environmental Software: Apple Skins* | |
| Apple //c or //e w/Monitor II Cover | 19.00 |
| Apple //c w/Color Monitor Cover | 21.00 |
| Apple //e Professional System Cover | 23.00 |
| Apple //c, //e, or UniDisk Drive Cover | 7.00 |

## Blank Media

| | |
|---|---|
| ***5¼" Blank Diskettes*** | |
| BASF 5.25" SS/DD *(box of 10)* | 10.50 |
| Elephant 5.25" SS/DD *(box of 10)* | 10.50 |
| Verbatim 5.25" SS/DD *(box of 10)* | 10.50 |
| Sony 5.25" SS/DD *(box of 10)* | 10.25 |
| Maxell 5.25" SS/DD *(box of 10)* | 10.25 |
| Nashua 5.25 SS/DD *(box of 10)* | 12.50 |
| Memorex 5.25" SS/DD *(box of 10)* | 13.00 |
| 3M 5.25" SS/DD *(box of 10)* | 12.00 |
| Dysan 5.25" SS/DD *(box of 10)* | 15.99 |
| ***3½" Blank Diskettes*** | |
| BASF 3.5" DS/DD *(box of 5)* | 14.00 |
| Bulk *(Sony)* 3½" DS/DD *(box of 10)* | 24.00 |
| Centech 3½" DS/DD Color Disks *(box of 10)* | 24.00 |
| Sony 3.5" DS/DD *(box of 10)* | 27.00 |
| Fuji 3.5" DS/DD *(box of 10)* | 26.00 |
| Verbatim DS/DD *(box of 10)* | 28.00 |
| Maxell 3.5" DS/DD *(box of 10)* | 28.00 |
| 3M 3.5" DS/DD *(box of 10)* | 28.00 |

## Printers

| | |
|---|---|
| **Brother** | |
| HR-15XL *(20cps)* Daisywheel | 319.00 |
| HR-25 *(23cps)* Daisywheel | 519.00 |
| HR-35 *(35cps)* Daisywheel | 729.00 |
| TwinWriter 5 | 839.00 |
| **Citizen** | |
| 120-D *(120cps)* W/NLQ 10" Carriage | 195.00 |
| MSP-10 *(160 cps)* 10" Carriage | 299.00 |
| MSP-15 *(160 cps)* 15" Carriage | 399.00 |
| MSP-20 *(200 cps)* 10" Carriage | 329.00 |
| MSP-25 *(200 cps)* 15" Carriage | 489.00 |
| **Epson** | |
| LX-86 | Call |
| FX-85 | Call |
| FX-286 | Call |
| EX-800/1000 | Call |
| LQ-2500 | Call |
| **Juki** | |
| 6000 *(10 cps)* Daisywheel/Par. | 179.00 |
| 6100 *(18 cps)* Daisywheel/Par. | 349.00 |
| 6200 *(30 cps)* Daisywheel/Par. | 489.00 |
| 6300 *(40 cps)* Daisywheel/Par. | 679.00 |
| **Okidata** Okimate 20 Color Printer | 125.00 |
| Microline 182P *(120cps Dot Matrix 10")* | 229.00 |
| Microline 183P *(120cps Dot Matrix 15")* | 389.00 |
| Microline 192P*Plus* *(200cps Dot Matrix 10")* | 359.00 |
| Microline 193P*Plus* *(200cps Dot Matrix 15")* | 529.00 |
| Microline 292P *(240cps Dot Matrix 10")* | 509.00 |
| Microline 293P *(240cps Dot Matrix 15")* | 649.00 |
| Microline 192 Apple *(160cps Dot Matrix 10")* | 389.00 |
| Microline 193 Apple *(160cps Dot Matrix 15")* | 559.00 |
| **Panasonic** | |
| KXP-1080AP *(100 cps) ImageWriter Compatible* | 249.00 |
| KXP-1080 *(100 cps)* NLQ Mode | 219.00 |
| KXP-1091 *(120 cps)* NLQ Mode | 249.00 |
| KXP-1092 *(180 cps)* NLQ Mode | 329.00 |
| KXP-1592 *(160 cps)* NLQ Mode | 449.00 |
| KXP-1595 *(240 cps)* NLQ Mode | 599.00 |
| KXP-3131 *(16 cps)* Daisywheel | 269.00 |
| KXP-3151 *(23 cps)* Daisywheel | 409.00 |
| **Star Micronics** NX-10 *(120cps)* Parallel | 249.00 |
| SG-15 *(120cps)* Parallel | 389.00 |
| SD-10 *(160cps)* Parallel | 339.00 |
| SD-15 *(160cps)* Parallel | 449.00 |
| SR-10 *(200cps)* Parallel | 489.00 |
| SR-15 *(200cps)* Parallel | 589.00 |
| **Toshiba** | |
| P-321 24 Pin *(216cps) Par./Ser. 10"* | 499.00 |
| P-341 24 Pin *(216cps) Par./Ser. 15"* | 799.00 |
| P-351 24 Pin *(288cps) Par./Ser. 15"* | 1079.00 |

## Disk Drives/Hard Drives

| | |
|---|---|
| **AST Research** | |
| MicroStor 10MB Tape Backup Only | 955.00 |
| MicroStor 10MB Hard Disk Only | 955.00 |
| MicroStor 10MB Hard Disk w/10MB Tape Backup | 1475.00 |
| **Central Point Software** | |
| *Mix and Match 5¼ & 3½" Drives:* | |
| Universal Disk Controller | 119.00 |
| Universal Disk Controller/800KB Drive Bundle | 279.00 |
| **Micro Sci** A2 Full Height | 149.00 |
| A5 Slimline //e | 149.00 |
| A5 Slimline //c | 159.00 |
| Micro Sci C2 Controller | 55.00 |
| **Mitac** AD-1 Full Height //e | 139.00 |
| AD-3C Slimline //e or //c | 129.00 |
| **Pico Products** | |
| Apple Half-Height II+, //e, //c ProAPP | 139.00 |
| ProAPP 20 MB Hard Disk System *(II+, //e, & //c)* | Call |
| **Video Technology Computers, Inc.** | |
| Laser FD 100c *(Apple //c)* | 139.00 |
| Laser FD 100c *(Apple II Series)* | 139.00 |

## Monitors

| | |
|---|---|
| **Amdek** | |
| Color Monitor 600 *(RGB)* | 399.00 |
| Color Monitor 722 *(RGB)* | 499.00 |
| **Precision International, Inc.** | |
| C-Vue Flat Panel Display (Apple //c) | 359.00 |
| **Princeton Graphics** | |
| HX-9 9" RGB Color | 399.00 |
| HX-12 12" RGB Color | 429.00 |
| **Sakata** SG-1000 Green | 115.00 |
| SA-1000 Amber | 125.00 |
| SC-100 Composite Color | 149.00 |
| SC-200 RGB Color | 339.00 |
| SC-300P RGB Color | 589.00 |
| **Taxan** 115 12" Hi-Res Green | 125.00 |
| 116 12" Hi-Res Amber | 129.00 |
| 620 12" Hi-Res RGB Color (640×200) | 389.00 |
| 410-80/64 RGB-II Interface | 179.00 |
| **Teknika** MJ-22 RGB Color Monitor | 259.00 |

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use to exploit the features of the new machine.

The first Apple IIGS systems that the system-software group had to work with were what Hillman called "El Grando Boards," networks of interconnected circuit boards that sprawled across several desktops in the lab. The custom chips that would reduce the chip count from the hundreds on El Grando to a handful on the Apple IIGS were on order, but they had a very long lead time. In the meantime, it was El Grando or nothing (see photo, page 57).

The code name for the project had gone from Phoenix, during its rebirth period, to Rambo, during those tense months when John Medica, the Apple IIGS's product champion, was fighting for final approval from the executive staff. A product champion coordinates the efforts of the hardware, software, and other teams involved in getting a new product out. "If anyone tells you the product's canceled," he'd say, "kick 'em in the kneecaps. Or tell me, and I'll kick 'em in the kneecaps." The name Rambo suited Medica, whose exuberant style helped focus attention on the project but offended almost everyone else.

The members of the system-software team had their own code name for the new Apple II. They called it Gumby (see figure 6). The name was inspired by programmer John Worthington's unlikely impersonation of the green rubber cartoon character at Apple's annual Halloween-day parade. You could almost gauge the mood of the team and their progress by the contortions and costumes of the rubber Gumby and Pokey toys that hung from the ceiling and decorated their cubicle walls. If Gumby was dressed for the disco, it was safe to enter the system-software area. If he had a suicide note pinned to his chest, it was best to come back another time.

**Firmware**

Firmware is a layer of programs that sits between a computer's hardware and application programs that use the hardware. Essentially, firmware saves application writers a lot of work. Instead of having to give detailed instructions to the hardware telling it what to do with each keystroke, how to interpret every mouse move, how to display information on the screen, where to put documents in memory, and how to get documents onto and off disks and out the serial port to a printer, the application can give general instructions—"make calls"—to the firmware.

Because the application leaves the nitty-gritty details up to the firmware, firmware can change to cope with hardware changes—changes in memory size, changes in graphics, changes in microprocessor speed, changes in the way the application works. As long as the same old call produces the same result, it doesn't matter what contortions the firmware had to go through to make it happen.

An example of the way firmware can hide changes in hardware from applications is the way a printer plugged into the printer port on the back of the Apple IIGS appears to be connected to an interface card in slot 1 on the main circuit board. On earlier models of the Apple II, everything was connected to the computer by the use of slots, so applications expected to find devices connected to slots. No problem. Apple IIGS firmware makes the ports look like slots containing interface cards. The information that was in the ROM on the interface card is now in the ROM on the main circuit board, and applications are none the wiser.

The challenge for Lehtman's group was to give developers a way to use all the new features of the Apple IIGS while fooling old software into thinking it was still talking to the same old machine.

One of the members of the group, Rich Williams, has been performing such firmware sleight of hand—pulling the wool over the eyes of unsuspecting applications to keep them compatible with new machines—since 1979. He came to Apple at the end of the first big hiring wave, when the company swelled from 100 to 250 employees. "We had disk drives connected to our Apples," says Williams of the olden days when he first came to Apple, "but we were still shipping a lot of programs on cassette tape."

"If you've done a good job with the firmware, you can make a lot of changes to the machine without affecting compatibility," says Williams. "If programs use the firmware and if we keep the firmware interface the same, the programs should work. Where you run into problems is where developers get in a bind and have to talk directly to the hardware. It might be that you didn't supply them with some tools they needed or you did supply the tools but they didn't like them, or you supplied the tools but you didn't document them well enough. So they work around the firmware and talk directly to the hardware, and when the hardware changes, their programs don't work anymore."

**Fitting It All into ROM**

Originally the system-software

***Figure 6: The IIGS system-software team with their mascots, Gumby and Pokey toys whose contortions and costumes reflected the mood and progress of the team.***

group was allocated 64K of ROM. "We thought that was terrific," Lehtman recalls. "After all, there's only 16K of ROM in Apple IIe. Then we started thinking about all the things we wanted to put into ROM, and we had to go back and ask for 128K."

BASIC had to go in, not because it was the best programming language or even the easiest to use, but because it was in the ROM of the original Apple II and in every Apple II since. If it weren't in ROM, none of the programs written in Applesoft BASIC would run on the Apple IIGS, and that would rule out hundreds of educational programs. So BASIC had a confirmed reservation.

*'The fundamental concepts are the same, but the Macintosh and Apple IIGS operating systems are radically different.'*

If putting BASIC into ROM was an idea borrowed from earlier generations of Apple II computers, putting mouse tools in ROM was an idea borrowed from the Macintosh.

Apple had been urging Apple II developers to adopt a standard user interface for years, but urging is no substitute for handing them the tools on a silicon platter. (The user interface is the way a program communicates with the person using it.)

"If you want people to use a consistent interface, there are two ways to go about it," says Williams. "One is to mandate what the interface is and tell developers that they have to use it. That's what we have done up until now, and that doesn't work. The other, which worked out very well for the Macintosh, is to provide all these built-in tools, and you say, 'You can go off and make your own interface and bust your butt, or you can use the stuff that's built in and have it easy.' People like to do what gets their programs done the fastest, so this argument is very convincing."

So the system-software group followed the Macintosh lead and put its mouse tools into ROM.

The Apple IIGS mouse tools are similar but not identical to the ones built into the Macintosh. The goal was not to be 100% compatible with the Macintosh tools, according to Williams, but to "steal" what was successful and change what needed to be changed because of the differences in the two machines. "The fundamental concepts are the same," says Williams, "but the Macintosh and Apple IIGS operating systems are radically different. It's not like you can spend 15 minutes with your Macintosh program and make it magically work on the Apple IIGS. And that's not such a bad thing. One of the things people praise about MS-DOS [the operating system used by IBM PCs and the PC clones] is that the same program can run on several different machines. It sounds wonderful, but the price you pay for generality is that the program is designed for the minimum machine, not taking advantage of any of the machine's special features. If you're writing something for the Apple IIGS, you want to change the application to take advantage of Apple IIGS features such as color and this fancy sound chip we've got. It isn't as if we sat back and said, 'Let's make it difficult for them to port things over because it's good for them.' It's not quite like eating broccoli. We just designed the tools that were best for our machine."

**The Control Panel**

The Control Panel is another idea borrowed from the Macintosh. It's a program in ROM that lets you set the built-in clock and change the way information is displayed on the screen, the touch of the keyboard, the responsiveness of the mouse, the way information is sent to printers and modems, and more. It lets you customize the look and feel of the computer system to suit yourself (see figure 7).

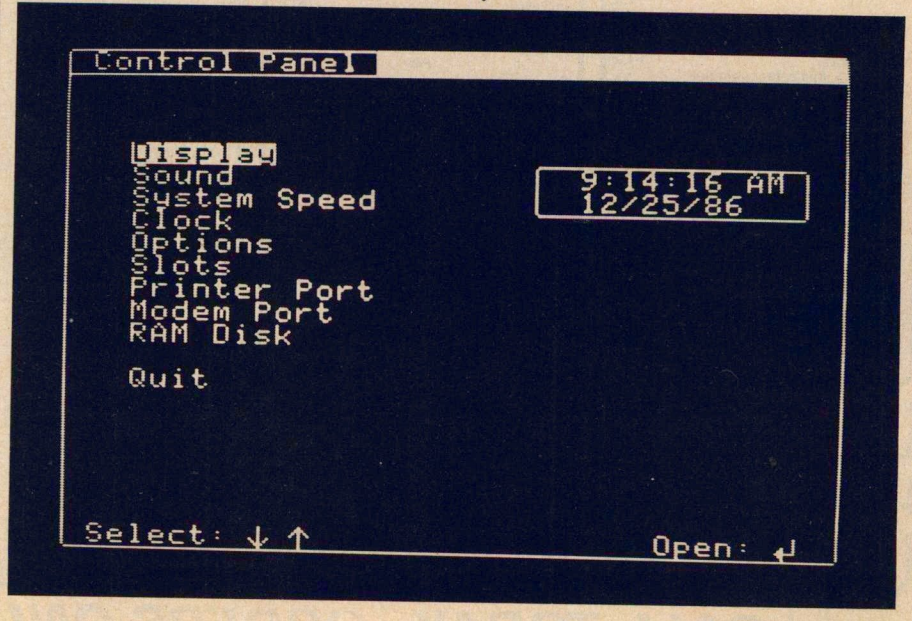
While the program that lets you change these settings is in ROM, your preferences are recorded in a special battery-powered RAM that doesn't get erased the way normal RAM does when the power goes off.

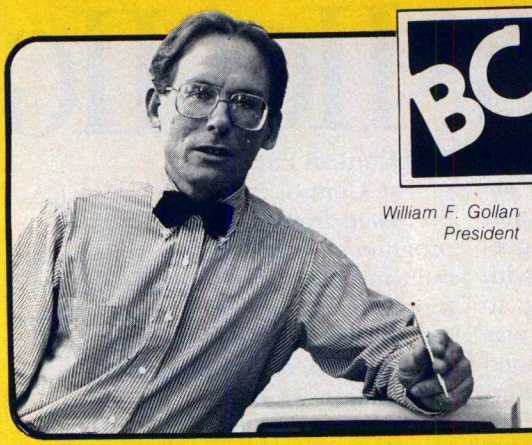
**Operating System**

Operating systems and utilities are also part of the system-software domain. A disk-operating system is a set of programs on every application disk that manages how information is copied from disks. Lehtman wanted his group to update ProDOS, the current Apple II disk-operating system, so it could take advantage of the Apple IIGS's additional memory and deal with the large storage devices that loomed on the horizon. And he wanted to create mouse-based utilities modeled after the utilities that were part of the Macintosh Finder.

ProDOS was developed at about the same time the Apple IIe was being developed—around 1983—and it

***Figure 7: The IIGS Control Panel is an idea borrowed from the Macintosh. It lets you customize the look and feel of the computer system to suit yourself.***





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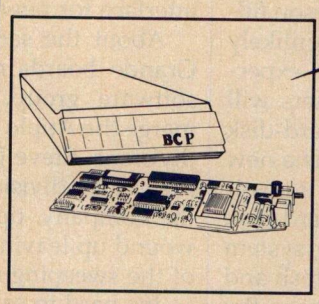


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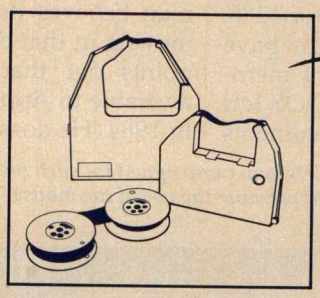

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was designed with room to grow. But the memory size and disk-storage capacity have grown at a rate that was hard to imagine in 1983, so ProDOS needed updating.

"At the time ProDOS was developed," says Williams, "5-megabyte hard-disk drives were a big deal, and ProDOS could handle 32 megabytes, so it seemed like it had a lot of room to grow. Well, nobody produces 5-megabyte hard-disk drives anymore. Very soon the standard will be 40 megabytes and then 80 megabytes." The new ProDOS doesn't put a limit on the size of the storage device.

It's hard to imagine one person filling 80 megabytes, and it's unlikely that any one person will. The expectation is that several computers will use one large-capacity hard-disk drive by forming a network. The new version of ProDOS will make it possible for ProDOS to share a hard-disk drive with another operating system (as it will have to do if Macintosh and Apple IIGS users want to share the same hard-disk drive).

Another reason for revising ProDOS is to enable more documents to be open in memory at one time. The current version of ProDOS allows for eight documents to be open at once. That was more than enough for 128K machines, but an Apple IIGS can have more than four megabytes of memory. The new version of ProDOS lets you have any number of documents open at once. With the new ProDOS, people will finally be able to keep their computer "desktops" as cluttered as their real desktops.

**Utilities**

Utilities are programs that handle disk maintenance and housekeeping chores such as copying disks and documents, deleting documents, renaming disks and documents, and so on. The System Utilities Disk available for the Apple IIe and IIc would have worked for the Apple IIGS, but Lehtman wanted mouse-based utilities that would be simpler to use and would promote the use of the mouse interface for new applications.

About the same time that the El Grando boards reached the system-software group, Apple decided to merge the Apple II and the Macintosh divisions. Steve Jobs, the head of the Macintosh division and cofounder of the company, opposed the idea and wound up leaving Apple in the wake of the sweeping reorganization.

It's hard to say what effect the reorganization had on the Apple IIGS project, but the Mac influence on the IIGS is unmistakable, from its detached keyboard to its mouse-based utility program modeled after the Macintosh Finder (see figure 8). Lehtman believes that the Apple II was moving in that direction anyway. He points out that mouse tools were available to Apple II developers back in 1984. He does concede that having the Macintosh people in the same building, on the same floor, was "very, very helpful" when they were adapting the mouse tools for the Apple IIGS. Bill Atkinson, who wrote MacPaint and many of the mouse tools for the Macintosh, helped Steve Glass create a color version of his program QuickDraw, which is the basis for the tools that draw the pull-down menus, dialog boxes, and other graphic elements that are the foundations of mouse-based applications.

Lehtman also admits that it would have been hard to put a mouse into the box if it hadn't been for the reorganization. "Steve [Jobs] didn't want us to use the mouse interface on the Apple II," says Lehtman. "He wanted the identities of the machines very separate. We felt there was enough difference in the technology of the two machines. It was a waste not to use such a powerful interface." ✚

**The Apple IIGS Book** ***by Jeanne DuPrau and Molly Tyson, published by Bantam Books***

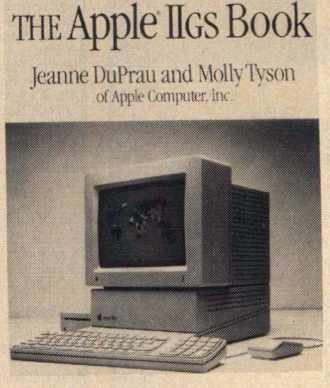
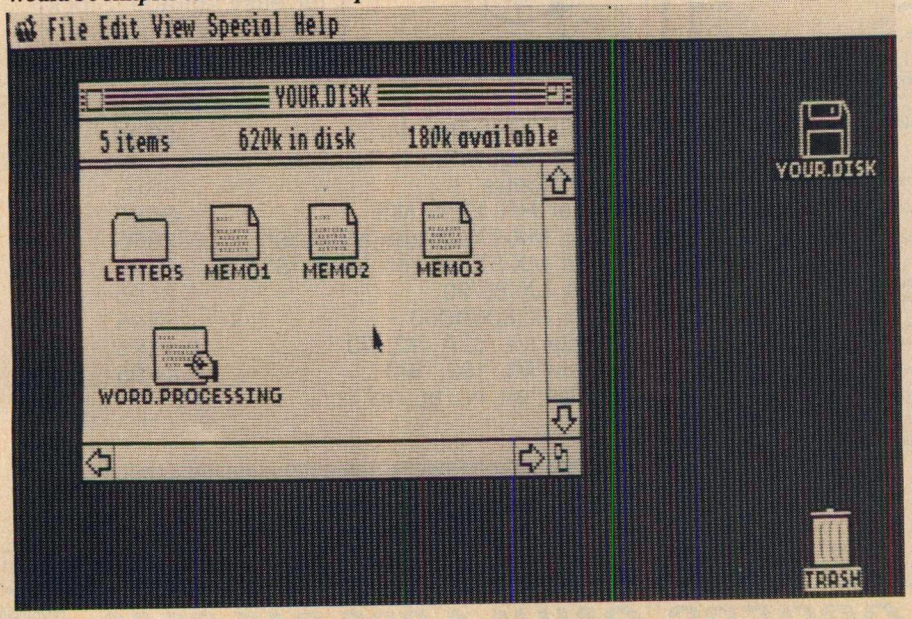



***Figure 8: The IIGS Finder screen. Lehtman campaigned for such mouse-based utilities that would be simpler to use and would promote the use of the mouse interface.***




*Jeanne DuPrau is a senior writer in Apple's User Education Department. She has written demonstration and training disks for the IIe, IIc, III, and Apple IIGS, as well as for the Lisa and Macintosh. She's written for textbook companies, newspapers, and magazines.*

*Molly Tyson is also a senior writer in Apple's User Education Department. She has written 35 Apple manuals including the* Apple IIc Owner's Guide *and the* Apple IIGS Owner's Guide. *Her writing has also appeared in* The New York Times, Runner, Self, Highlights for Children, Popular Computing, *and* Women's Sports *magazines. "The Making of the Apple IIGS" is adapted from* The Apple IIGS Book. *© 1986 by Jeanne DuPrau and Molly Tyson. Used by permission of Bantam Books, Inc. All rights reserved.*

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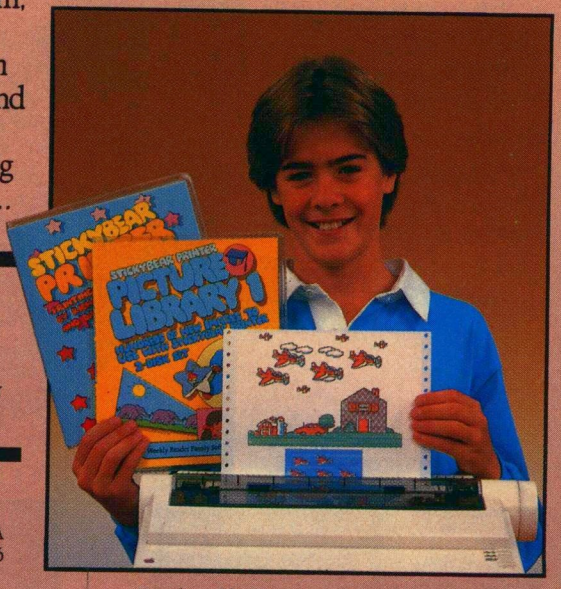


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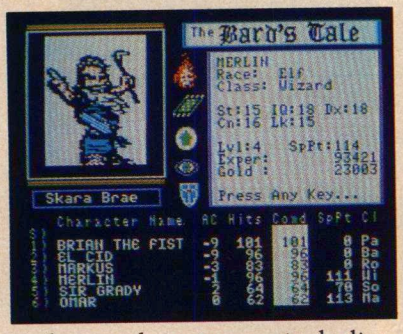


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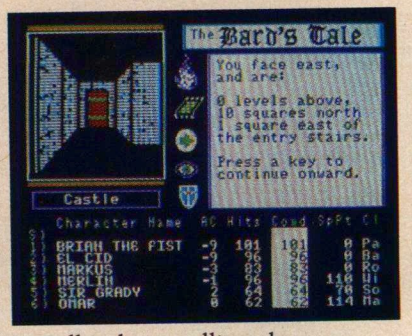


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**PROGRAMMING** *BY DANNY GOODMAN*

*An introduction to the Apple IIGS Toolbox*

# WHAT'S IN THE IIGS TOOLBOX?

The Apple IIGS is the most recent step in an evolutionary climb that dates back to the earliest days of personal computers for everyday people. The IIGS is at once compatible with its past and representative of the future.

You can run thousands of programs and plug in hundreds of boards already available for earlier-generation Apple II computers. At the same time, by offering casual Apple II programmers and serious developers alike built-in programming power matched only by the Macintosh, the IIGS paves a path to new generations of innovative and truly convenient software designs.

The programming power inside the Apple IIGS consists of a carefully crafted programmer's toolbox that simplifies the design of sophisticated Apple II programs, for both newcomers and experienced programmers.

## TOOLBOX ORGANIZATION

Several tools are built into the IIGS's ROM, and the rest, called RAM tools, arrive on a ProDOS 16 start-up disk, located in a disk subdirectory called Tools. The location of a particular tool will probably change over the life of the Apple IIGS. As the machine matures, Apple will surely produce updates to the RAM tools and perhaps the ROM. Just as the Macintosh was upgraded from a 64K ROM to a 128K ROM in 1986, so too might the Apple IIGS be upgraded from a 128K ROM to a 256K ROM in the future. When that happens, more of the toolbox will likely be incorporated into ROM. Memory-map locations of tools will be entirely different from what they are today. Fortunately, such changes won't affect your programs, because one of the tools, called the Tool Locator, points your program to the right tool, no matter where it comes from or what part of the memory map it's in. Therefore, it should be of little consequence whether a particular tool set arrives on your machine in ROM or on disk to be loaded into RAM. Hereafter, we will consider the toolbox as if it were a single source, as you should.

A tool set consists of functionally related routines. Some tool sets have the name Manager tacked on, largely as a carryover from the Macintosh programming environment. A tool set and a manager are one and the same.

The organization of tool sets is primarily for the convenience of us humans who need to examine supporting documentation for a particular programming operation. For example, if you want to know more about the details of creating a window on the screen, you can narrow your search through the reams of Apple IIGS technical documentation by focusing on the section covering the Window Manager. Inside the toolbox (in memory), individual tools are simply stacked atop one another. Routines from the same tool set may be in adjacent areas of the memory map, but they don't have to be.

## TOOLBOX ROAD MAP

It's difficult to list the tool sets without appearing to assign a specific order to them. Many tool sets rely on others either directly—a tool in one set may automatically call a tool in another set—or indirectly—one tool may require that a tool in another tool set be in use prior to execution, because your program must use tools in both sets. All this is a preface to saying that the following description of key tools sets should not imply any rigid hierarchy in the IIGS toolbox. Tool sets that have the most impact on others are the Tool Locator, Memory Manager, and QuickDraw II, so we'll look at them first. To master the toolbox, however, you will have to study each tool and tool set on its own, including ones that are not detailed here.

### Tool Locator

Most application programmers will not come into direct contact with the Tool Locator, since its main job is

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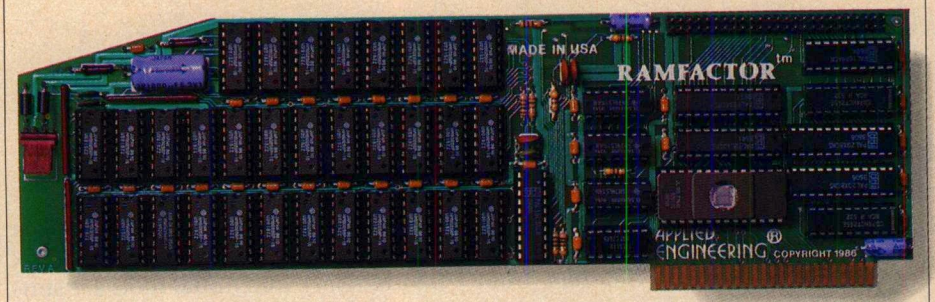


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to do a lot of dirty work behind the scenes for the programmer. It is the mechanism that finds the location in memory of toolbox routines that your program needs. It gets an assist from the system the IIGS designers established for numbering major tool sets and each tool therein.

For example, when your program needs to use a toolbox routine, the Tool Locator automatically looks up the actual address of that tool by first checking in a table of pointers to tool sets and then looking in a table of pointers to tools in that particular tool set (see figure 1).

The Tool Locator also allows experienced programmers to develop their own tools or their own versions of existing tools and have the program summon those new tools in place of the built-in IIGS tools.

**Memory Manager**

Toolbox programs on the IIGS require a considerable amount of memory management. A program must request an allocation of memory before loading in its remaining portions. It should also deallocate that memory when it is no longer in use. Although these requirements may seem like a burden, they allow a great deal of program-design flexibility. If you divide your program into several modules or segments, the program can load in only the segment(s) needed for a particular operation the user is performing. When that operation is finished, the segment can be withdrawn (purged), available memory compacted, and another segment loaded into memory in its place. This method gives you the opportunity to shoehorn very large programs into machines that have only the standard 256K of RAM.

In figure 2, the left memory map shows two program segments separated and surrounded by blocks of program data (perhaps text in a word-processing document). When Segment #2 is no longer needed, it can be purged from memory. Doing so, however, leaves memory fragmented, without room for a large program segment, such as Segment #3. The Memory Manager can compact the memory and open up enough space to tack on Segment #3, as shown in the right memory map.

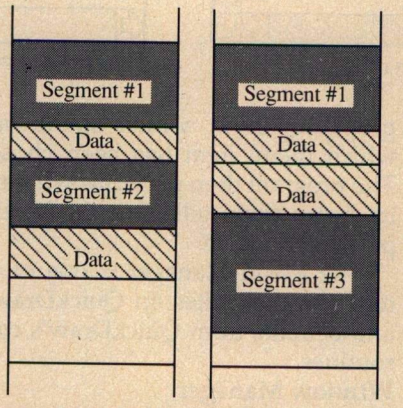


*Figure 2: Purging and compacting memory makes room for a new segment.*

The Memory Manager, when asked, also advises your program of the amount of memory available at a given moment. If the computer has a memory-expansion card, the program won't have to deallocate memory to make way for a new segment, because there will probably be enough free memory for the new segment (see figure 3). Thus, with the help of the Memory Manager, the program changes its memory utilization. Users with expanded memory will be rewarded by not having to wait for a program segment to load from the disk each time they require its particular set of operations. Once Segments #2 and #3 are loaded into memory, they will stay there, except in the case of further competition for memory space.

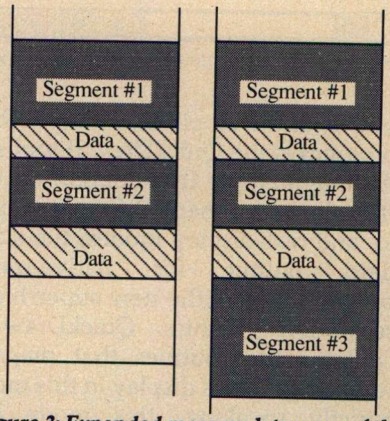


*Figure 3: Expanded memory lets more of the program stay in RAM.*

Although you have to know the Memory Manager quite well to program in assembly language, a high-level language will automatically perform most basic Memory Manager calls for you. You'll still have to be aware of this manager's abilities and requirements, though, for more sophisticated memory tasks.

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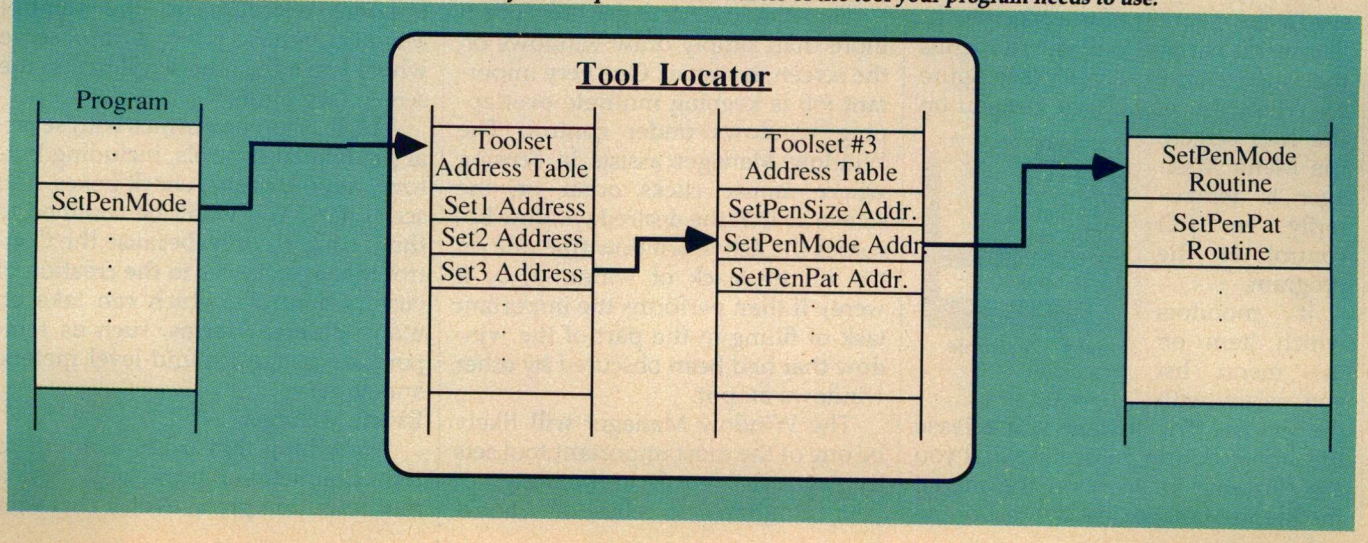
*Figure 1: The Tool Locator mechanism automatically looks up the actual address of the tool your program needs to use.*



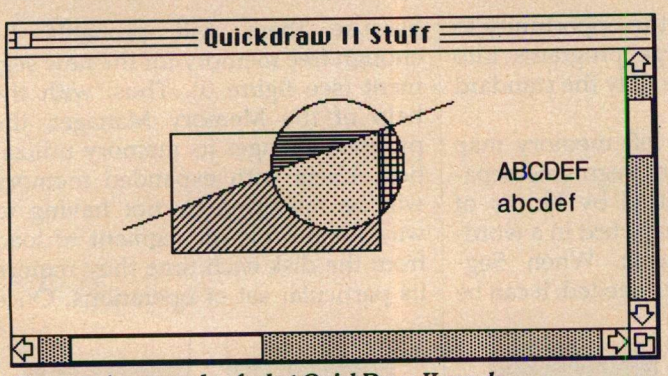



*Figure 4: An example of what QuickDraw II can do*

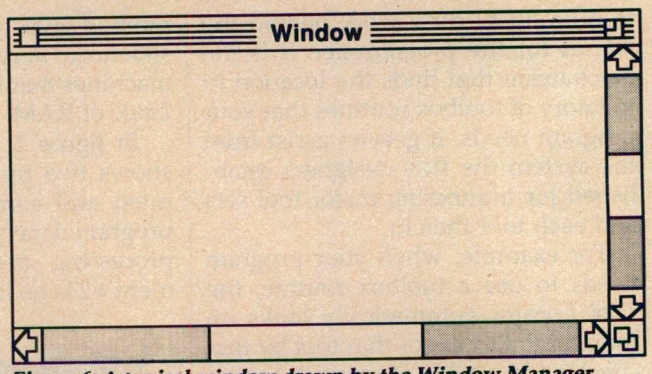



*Figure 6: A typical window drawn by the Window Manager*

output of the Apple IIGS in a toolbox program is the QuickDraw II tool set. Although Apple II emulation on the IIGS allows for many different graphic- and text-display modes, the standard output for native-mode programming is the new super-high-resolution graphics. QuickDraw II contains the routines that manage text and graphics display in this mode (strictly speaking, this mode has nothing but graphics, because text is displayed as bit-mapped graphics, not as built-in text characters as in other Apple II display modes).

QuickDraw II is responsible for drawing windows, menus, text characters, graphic shapes, fill patterns—essentially every picture element on the screen (see figure 4). Even the ProDOS 16 Finder operating system makes calls to the QuickDraw II tool set to create its video output. Because many other tool sets use QuickDraw II, a firm understanding of its key graphics concepts is essential for using many other tools.

**Menu Manager**

Routines in the Menu Manager assist in the creation of the Macintosh-like menu bar and pull-down menus that appear on the screen (see figure 5). When you pull down a menu on the IIGS screen, the Menu Manager is temporarily in full control of the program.

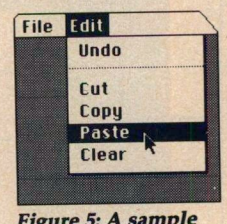



*Figure 5: A sample IIGS menu*

It monitors which item on the menu list you select with the mouse. The instant you release the mouse button, indicating that you are choosing an item on the menu, the Menu Manager lets the rest of the program know which menu and which menu item has been chosen. The program then performs whatever its instructions tell it to do for that particular choice.

The Menu Manager is one of the tool sets that relies on QuickDraw II and benefits from QuickDraw's color routines.

**Window Manager**

Action in most of your programs will take place in one or more on-screen windows. Even if the screen you ultimately generate does not look like the windows you see in the Finder, as far as the IIGS is concerned, it will be a window. Creating a window of any kind—from a simple full-screen blank area to a complex one with a title bar, scroll bars, and other features—is the responsibility of the Window Manager. When your program gives instructions to the Window Manager to create a window, the Window Manager adheres to specifications in a set of parameters, which instruct the Window Manager on the exact characteristics of the window (see figure 6).

The Window Manager does much more than simply draw windows on the screen, however. One very important job is keeping multiple overlapping windows under control. The Window Manager assists in sensing where mouse clicks occur on the screen so that the desired window becomes the active window (the one on top of the stack of windows, as it were). It then performs the important task of filling in the part of the window that had been obscured by other windows atop it.

The Window Manager will likely be one of the most important tool sets to play a visible role in the design of your programs. It relies on QuickDraw II for drawing window elements, and it relies on the next tool set, the Control Manager, for scroll bars and other features.

**Control Manager**

A control in a IIGS application can take the form of an on-screen button that you "press" with the mouse pointer; window scroll bars; a check box, which allows you to select one or more options from a list; or another on-screen device whose activation with the mouse pointer produces clearly defined actions in the program. All of these IIGS screen objects are created and managed by the Control Manager.

Since controls are graphic objects that are placed in a window, the Control Manager works in concert with both QuickDraw II and the Window Manager. For instance, when you adjust the scroll bar in a window, the Window Manager temporarily passes program execution to the Control Manager, whose job it is to observe where you adjust the scroll bar on the screen (see figure 7).

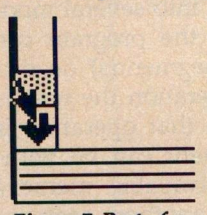


*Figure 7: Part of a window's scroll-bar control*

The IIGS toolbox comes with several predefined controls, including buttons, radio buttons, check boxes, and scroll bars. You won't be confined to these controls only, because the Control Manager assists in the creation of custom controls, which can take on many different forms, such as temperature gauges, sound-level meters, and so on.

**Event Manager**

Everything that exists as input to the computer—a press of a key, a mouse-button press, even a character

coming in through a serial port—is called an event. Your program, then, looks into the event record, decides what kind of event it is, and acts accordingly.

Additionally, the Event Manager can keep track of a series of events that happen too quickly for the computer to handle all at once. The list of events is kept in a section of memory called the event queue. For example, if you want to close two overlapping windows that are open on the screen, you can quickly click on the Close boxes in the two windows. You might click on the box on the second window before the program has finished removing the first window from the screen. Both clicks of the mouse go into the event queue. The program immediately takes the first mouse click from the queue (popping it from the stack, if you will). As soon as the program closes the first window and activates the second, it "polls" the event queue to see if anything is in there. In this case, the second mouse click is there. Pulling this event from the queue, the program closes the second window. Users benefit because they don't have to wait for the screen action to catch up with two closely spaced mouse actions.

**Sound Manager**

The Apple IIGS, of course, can emulate the single-tone sounds that the Apple II family's internal speaker produces. But the IIGS also includes a powerful sound-generator circuit, created by Ensoniq, called the Digital Oscillator Chip (DOC). This chip, along with 64K of RAM dedicated to the sound circuitry and two other chips, gives the IIGS remarkable sound capabilities for a personal computer (see figure 8).

The DOC chip includes 32 oscillators (tone generators). One of the oscillators is turned into a special clock that the sound circuitry has to itself. Common practice is to pair oscillators to produce high-quality tone for music. That leaves enough oscillators for 15 independent voices. The Mac, by comparison, has only 4 voices.

To gain access to these wonderful sound abilities, you use the Sound Manager.

**Dialog Manager**

According to *Apple User Interface Guidelines*, a program designer can obtain information from a program user by way of a device called a dialog box. A dialog box essentially asks you questions, and you supply answers—you and the program carry on a kind of dialogue. For example, if you want users to establish settings for the way a printed page should look—paper size, margins, text of a header or footer, and so on—you can offer a menu choice called Page Setup or something similar. When a user chooses that menu item, a new window appears atop the current work area and requests information, such as a click of a radio button to select the paper size from a list of three possible sizes (see figure 9). The new window that prompts for this information is called a dialog box.

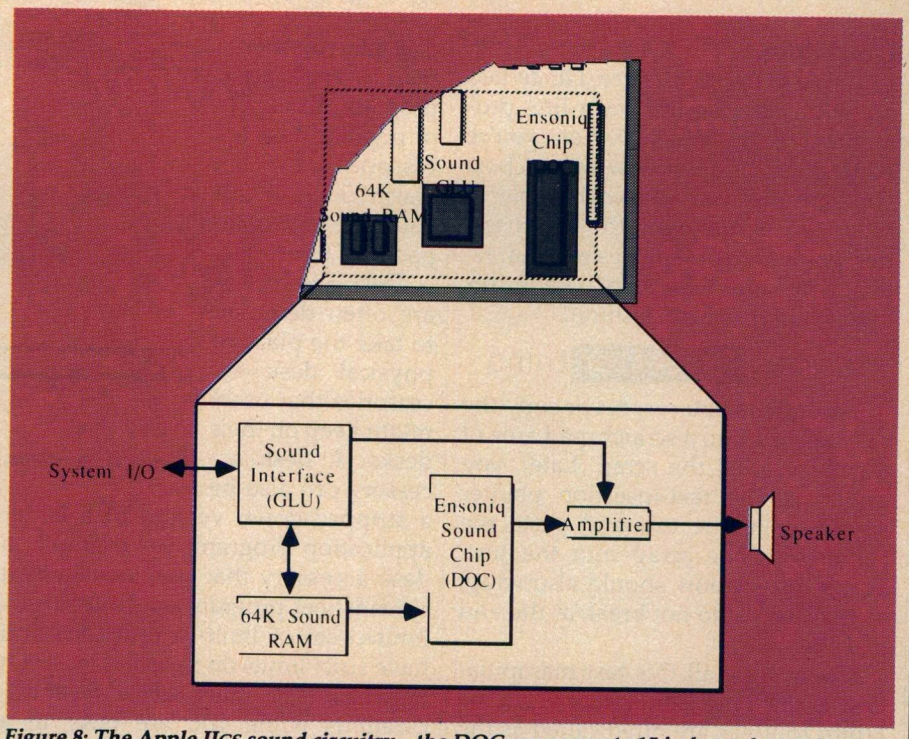
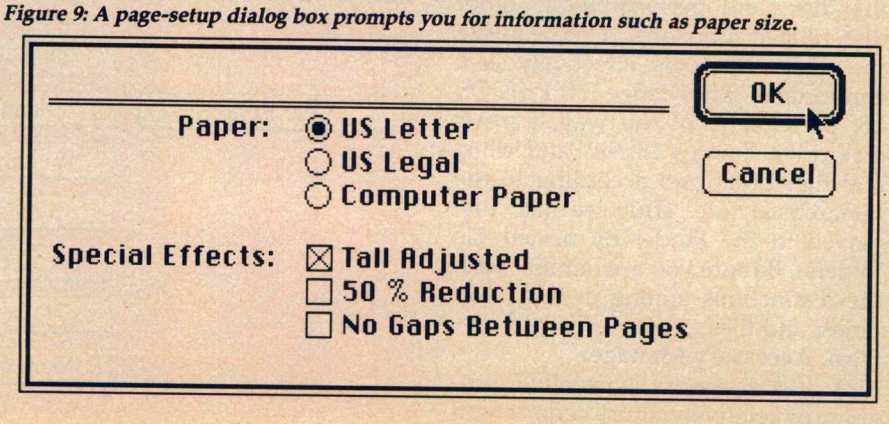



*Figure 8: The Apple IIGS sound circuitry—the DOC can generate 15 independent voices.*

The Dialog Manager handles many routines that create dialog boxes. This tool set relies on tools from many other sets, although most of that reliance exists behind the scenes. For instance, a dialog box is a window, so the Dialog Manager calls many of the tools the Window Manager provides. A dialog box also frequently contains one or more controls—radio buttons, OK buttons, check boxes—so it's no stranger to the Control Manager. If the dialog box has a text-entry box in it, then it calls on the tools built into the Line Editor tool set. Dialog Manager tools make many of these external calls on their own, letting you accomplish more with your dialog boxes with fewer steps in your programming.

*Figure 9: A page-setup dialog box prompts you for information such as paper size.*



### Line Editor

Apple's *User Interface Guidelines* are quite clear on the ways IIGS programs are to behave when you're editing text in a window or text box. For example, you should be able to select text by dragging the text-insertion pointer across the desired characters, which are then displayed in this inverse, highlighted fashion:

'Tis a far, far better thing

From there you can cut or copy the selected text into a scratch-pad area of memory called the scrap. Later, you can place the text-insertion pointer anywhere in the text and paste the contents of the scrap into the text. Text in its window should also wrap, so that words do not break at the end of a line.

Controlling all this text manipulation is the Line Editor tool set. Line Editor routines are often called as the result of menu choices (e.g., Cut, Copy, and Paste). They are also called automatically by the Dialog Manager, as we saw above. The Line Editor itself is not concerned with the text font or font size. Those aspects are left up to QuickDraw II, on which the Line Editor relies heavily. Even if your program is entirely graphics-oriented, such as a game program, you may still need to invoke the Line Editor at the beginning of the program if desk accessories require Line Editor tool functions.

### File Operations

If your programs will be reading from and writing to disk files, you'll need to be familiar with the tools in the File Operations tool set. These are the tools you will use to create new files on the disk, open existing files, read data from the disk, write data to the disk, and perform many other disk-related functions. A prerequisite for using the tools effectively is a comfortable knowledge of ProDOS 16, particularly of the way it treats disk-drive devices (drives and slots) and files organized according to the hierarchical file structure (as displayed in the Finder by nested file folders). Be sure you are familiar with the distinctions among devices, volumes, and files.

### Desk Accessory Manager

A desk accessory is usually a program of relatively short code length that can run atop a main application program. Examples of popular desk accessories are an alarm clock, a calculator, and a notepad (see figure 10).

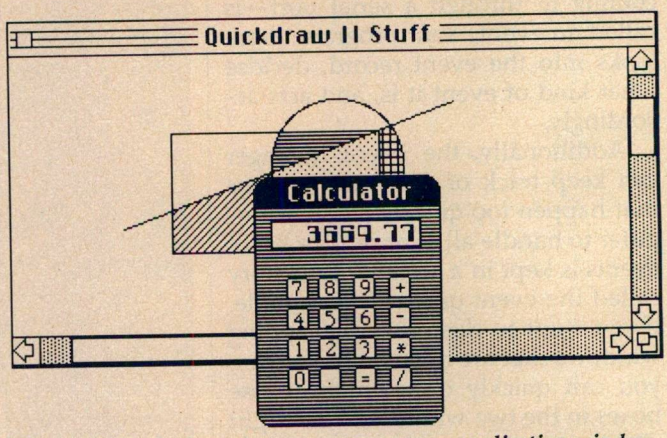



*Figure 10: A calculator desk accessory atop an application window*

Desk accessories are often designed to take the place of physical desk accessories that users might keep on their desks. A desk accessory can also be a stripped-down version of a larger application program. For example, a desk-accessory that provides a small spreadsheet program might feature a limited set of built-in functions and have strict limits on its total size, yet it may be fine for quick spreadsheet calculations while you are busy in a word-processing program.

Two types of desk accessories can be used on the IIGS: classic desk accessories (also called CDAs) and new desk accessories (or NDAs). Classic desk accessories can be called from within programs running in the emulation mode and, usually, the native mode as well. New desk accessories operate only when the IIGS is running in the native mode. If you've experimented with the Control Panel desk accessory on a IIGS, you've experienced a classic desk accessory, since it sets system configurations from either the native or emulation mode.

Keeping your program and a desk accessory alive at the same time falls under the job description of the Desk Accessory Manager. Among its functions is to check whether a desk accessory you are about to call can work in the program environment you are working in. If your program is to be receptive to the running of desk accessories atop it, the program must make provisions for the Desk Accessory Manager's tools.

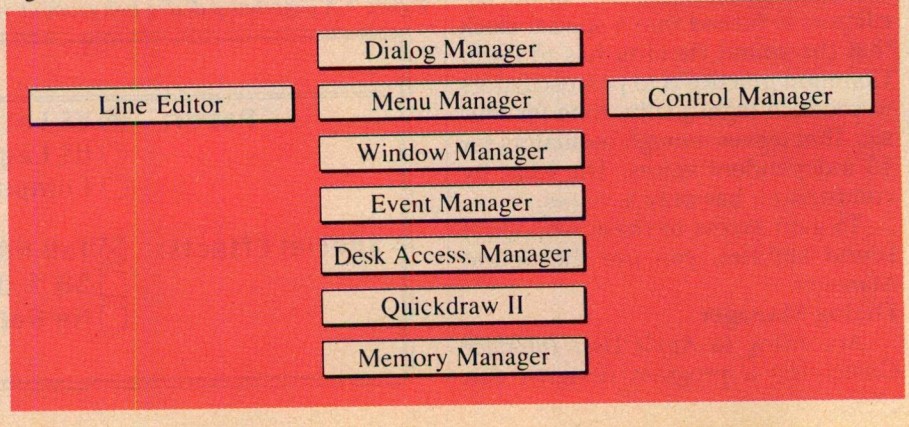
### SANE

The term SANE is Apple's acronym for Standard Apple Numerics Environment. These tools consist of built-in routines for various math functions, including floating-point math operations (addition, subtraction, multiplication, division, square root), logs, exponentials, trig functions, time-and-money calculations, random-number generation, and many more. You can find them in the Macintosh toolbox as well. SANE has been fully documented and is part of the *Apple Toolbox Reference* series.

### Other Tools

The above tool sets are the ones that get most of the headlines in Apple IIGS toolbox documentation, but many more tools are available to ease the programmer's task. Among the miscellaneous tools you may find

*Figure 11: The tool-set hierarchy. Experienced programmers can modify these relationships.*



helpful to you are those that

- access information stored in the battery-backed-up RAM connected with the real-time clock circuitry of the IIGS;
- allow you to retrieve clock (time and date) information for inclusion in your programs;
- let you move information in and out of peripheral cards plugged into the IIGS's slots;
- give you control over printing with a variety of output devices (grouped together as the Print Manager); and
- access and control information copied into the area of memory called desk scrap (sometimes called a Clipboard) for retrieval or storage on disk (the Scrap Manager).

**TOOL-SET INTERDEPENDENCIES**

We've noted several cases in which one tool set relied on routines in other tool sets, often making calls to those other tool sets automatically without intervention from the programmer. After a while, these interrelationships will become second nature to you, but for now they may seem like a tangled web of threads running through the IIGS toolbox.

At great risk, we have attempted to diagram the relationships of the major tool sets described above. One risk is that newcomers will consider these relationships to be a rigid structure, when in fact the toolbox relationships established by Apple's designers are flexible enough to sustain many modifications by experienced programmers. Another risk is that the diagram is by necessity an oversimplification of the threads running through the toolbox. With those warnings in mind, we offer a hierarchy of tool sets (see figure 11). Those at the bottom form the foundation on which higher-level tool sets rely. ✚

---

*Danny Goodman has been using, programming, and writing about personal computers since the late 1970s. He is the author of nine books, including* Going Places With the New Apple IIc, *which has been translated into four European editions, and* The Idea Book For Your Apple II. *"What's in the Toolbox?" is adapted from* Apple IIGS Toolbox Revealed. *© 1986 by Danny Goodman. Used by permission of Bantam Books, Inc. All rights reserved.*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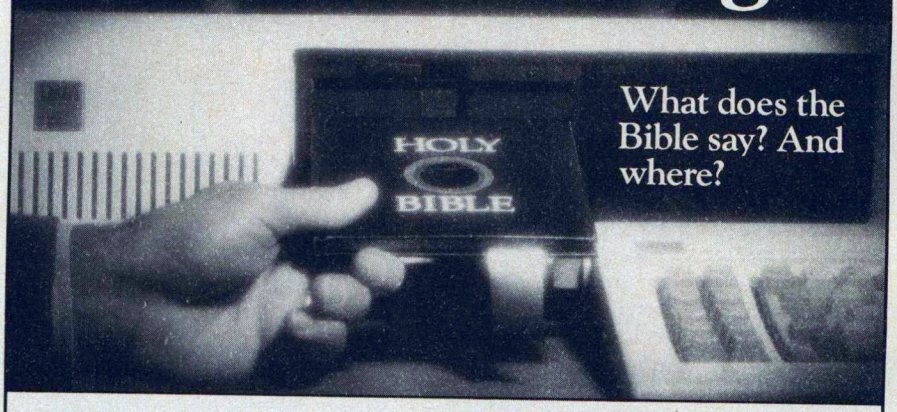


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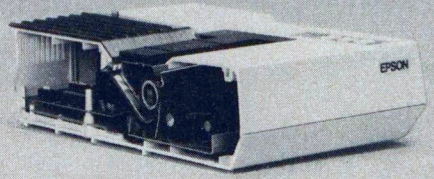


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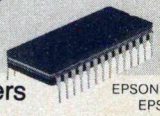

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*Some basic concepts to get you started*

# ProDOS FOR BEGINNERS

**TUTORIAL**

*BY CRAIG CROSSMAN*

When you initially encounter ProDOS, among the first terms you'll notice are *prefix*, *pathname*, and *subdirectory*. Even if you never program, you still need to know what these words mean.

Knowing the basics of these three integral parts of ProDOS will give you the best control of ProDOS application programs, such as AppleWorks, Apple Writer, and programs from Software Publishing Corporation. These three elements let you consolidate related ideas, file them in an organized manner, and even hide them from prying eyes.

Since AppleWorks is one of the most popular ProDOS programs, I've used it as the model for my examples. Actually, everything here is applicable in a general sense to most standard ProDOS application programs, although the specifics of putting the information into practice may vary.

**Pathname**

As you probably know, you must format or initialize a diskette when you want to use it for the first time. Most ProDOS application programs take care of this task for you. To select the formatting option in AppleWorks, you choose the fifth item, Other Activities, on the main menu. Choice 5 in the next submenu is Format a blank disk. After selecting this option, you will be asked to give the diskette a name. For our example, type in the name DATA.DISK (see figure 1).

Unlike DOS 3.3, which uses slot and drive numbers only, ProDOS can locate a diskette by its name, searching slot by slot and drive by drive until it finds it or determines that it isn't there. (You *can* use slot and drive numbers in ProDOS, but, as you will see later, this approach can be limiting.) If you want to access any data stored on this diskette, you will need to know the diskette's name. It is the first part of the pathname, the route you must take to access any data on the diskette.

You may be thinking that it would just be easier to use slot and drive numbers to access data on diskette. Well, if all of your data files were on the main directory (the listing, like a table of contents, of the files on your data disk), it would be. The main directory is the only directory you will be able to see if you use the slot-and-drive method of looking for your data, however. What you will miss is any data listed in a subdirectory.

*Learn to tap the power of ProDOS to help organize your data and programs.*

Think of your data diskette as a filing cabinet. When you open one of its drawers, you see many single sheets of paper. The sheets each represent a complete data file of a certain type, such as a word-processing document, spreadsheet, or database. AppleWorks automatically shows them alphabetically and sorts them by type, but you may want to organize them even further. Say you have a couple of spreadsheets and some associated letters. You want to keep them together, and, since they relate to the other documents, you want to keep them all in the same filing cabinet (diskette).

To group the associated documents, you simply reach for a manila folder, place the sheets of paper into it, and put the folder back into the filing cabinet. Simple, right? Well, it's the same thing with ProDOS. Creating a subdirectory is like reaching for a manila folder. Once you've created it, you can continue to add data that relates to the documents you originally stored there. In the AppleWorks Other Activities menu, the third choice is Create a subdirectory, and when you choose it, you have to provide the complete pathname.

Say that you have named your data diskette DATA.DISK and that you want to create a subdirectory (folder) called PROJECT1. You type /DATA.DISK/PROJECT1/ to create the new subdirectory (ProDOS uses slashes as separators). Note that this pathname begins with a slash and ends with a slash (see figure 2). A slash at the end of a pathname means that there is more to come; without the final slash, PROJECT 1 would be the filename, rather than a subdirectory name.

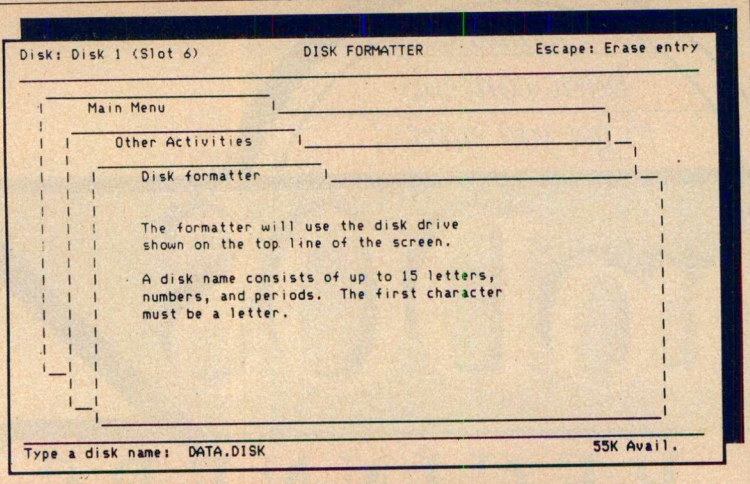


*Figure 1: Unlike DOS 3.3, ProDOS recognizes a diskette by its name. One way of assigning a name to a diskette is by formatting it.*

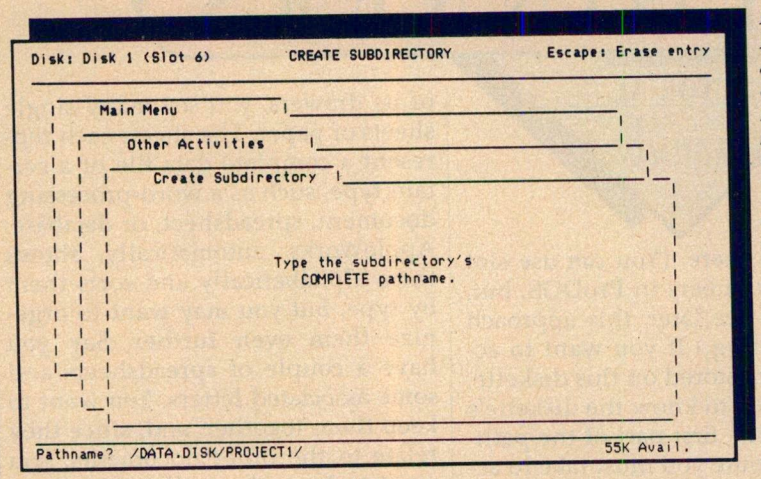


*Figure 2: ProDOS allows you to create and name subdirectories (folders), which helps you organize your data.*

After you create a subdirectory, you'll want to put things into it. Well, for convenience, you can tell ProDOS to remember the new pathname, so you don't have to retype the entire pathname when putting files into your new subdirectory. How do you tell ProDOS to remember the pathname? By using the Prefix command.

**Prefix**

The prefix is simply the currently defined pathname or portion of a pathname. The default prefix is usually the name of the diskette with which you start the computer, but AppleWorks changes the prefix to the name of the data diskette you defined when you first set up the application program. When you're setting the data-diskette location in AppleWorks, if you simply choose drive 1 or drive 2 (probably in slot 6), you're not giving ProDOS enough information to access data in the folders (subdirectories). Selecting the location of a data diskette simply by the slot and drive numbers can point only to the filing cabinet and not to the manila folders (subdirectories) within it.

Most ProDOS application programs allow you to define a new pathname (AppleWorks can remember only one at a time), and then they set the prefix for you (determine the pathname that AppleWorks is supposed to remember). For example, in AppleWorks when you select Add files to the desktop from the main menu, the next submenu offers two main selections, Current disk: and A different disk. When you select the second choice, you are asked to select from all the available disk drives on your system or a "ProDOS directory." If you select ProDOS directory, you are asked to type in the new ProDOS prefix. So you type in the pathname (prefix) to your new subdirectory (/DATA.DISK/PROJECT1/) and if you have created a subdirectory as described above, AppleWorks will remember it. Next time you try Add files to the desktop, AppleWorks will list your subdirectory pathname as The current disk: /DATA.DISK/PROJECT 1/ or whatever prefix you've set. Chances are you will not see anything, since you haven't put any files into the subdirectory yet. You can save files in the subdirectory by creating new files from scratch and then choosing Save desktop files to disk from the main menu.

You can carry these concepts even further. Why not create a sub-subdirectory? That's like putting a folder inside your folder. You can have, say, different dates associated with PROJECT1 and group documents together in several folders in the first folder. PROJECT1 could contain 12 folders (sub-subdirectories), one for each month, and you could set them up as in figure 3.

Why not put a folder into a month folder? That would be a sub-sub-subdirectory, and it would look like figure 4.

Those of you who have been using DOS 3.3, with its lone directory, can now see the advantages of being able to group related topics in this manner instead of having one hopelessly long catalog of files. And now, with cheaper mass-storage devices, such as Apple's UniDisk 3.5 with its 800K of storage and the ever-growing number of hard-disk drives with 10 and 20 megabytes of storage, this grouping capability isn't a luxury—it's a necessity.

Try my examples on your Apple to see ProDOS in action. With a little practice, you will be well on your way to tapping the power of this operating system to help organize your data and programs. ✚

*Craig Crossman is vice president of operations for an authorized Apple dealer in West Palm Beach, Florida. He is also a contributing editor of other Apple publications and the Apple expert for The Source and Viewtron.*

*Figure 3: Sample sub-subdirectories*

/DATA.DISK/PROJECT1/JAN/your data file's name
/DATA.DISK/PROJECT1/FEB/your data file's name
/DATA.DISK/PROJECT1/MAR/your data file's name

*Figure 4: A sample sub-sub-subdirectory*

/DATA.DISK/PROJECT1/FEB/APT2/your data file's name

# "Jack's my name, hacking's my game."

I'm Hacker Jack, modern day digital explorer. I've searched the world over from Silicon Valley to Singapore to bring you the best family programs around. Exciting. Creative. Educational. My new line of innovative software is the best of the best. I'd stake my reputation on it.

There's my friend Ted and his games for kids. A trip to Vegas without leaving home. Even hi-tech hot licks for you guitarists! They're all great, if I do say so myself. So call me now, and order yours right away.

Hacker Jack

**Introduce your kids to a new pal: Ted Bear.**

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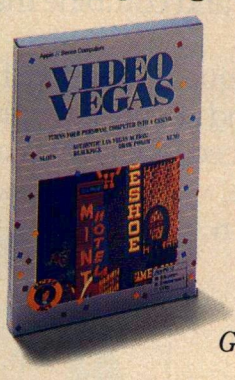


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With my *Guitar Wizard* program, you music-makers (MTV to classical) can locate fingerings and fretboard patterns for chords and scales in any key – in a snap! Music theory and technique, scales, and enhanced improvisational skills are right at your fingertips. So let me put *Guitar Wizard* right in your hands for a low, sweet-sounding price!

**Call me, Hacker Jack, to order these incredible programs now. Dial 1-616-957-3036!**

My many fine dealers all over the country can sell you these programs at my low prices.

Or call me direct (a chance to talk to the famous Hacker himself!) at 1-616-957-3036. Ask for Jack. Or hack off this coupon and send it to me with a check or money order.

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| | Apple // | C64 | Atari 800 | Amiga | IBM | Atari ST | Macintosh |
|---|---|---|---|---|---|---|---|
| Video Vegas | $29.95 | $29.95 | $29.95 | $34.95 | $34.95 | $34.95 | $34.95 |
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Send me:

Quantity ___ Rainy Day Games $_____
___ Video Vegas $_____
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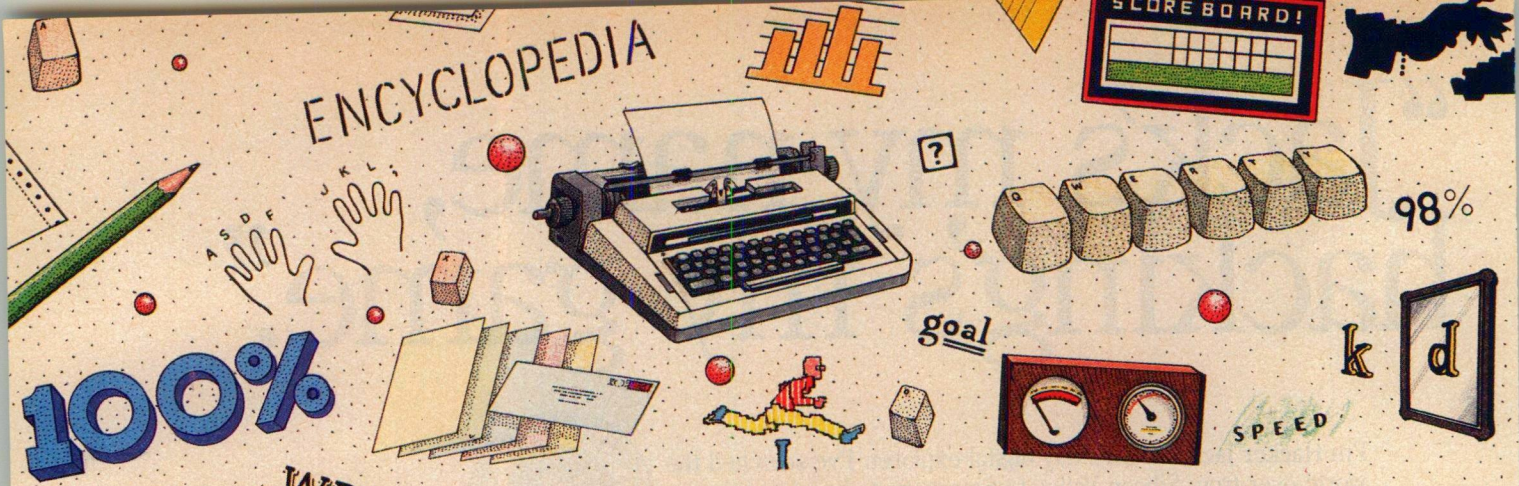
Postage & handling $ 3.50
Total amount enclosed $_____

Method of payment:
☐ Check or Money Order ☐ VISA ☐ MasterCard
Card No. _____ Exp. date _____

Signature _____
Name _____
Address _____
City/State/Zip _____
Daytime phone (____) _____
Computer Model _____

*Yes, within 14 days of purchase, if you're not delighted with the program, please call us and we'll gladly arrange a refund.

CIRCLE 310 ON READER SERVICE CARD

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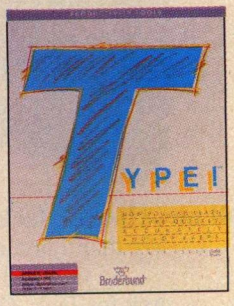


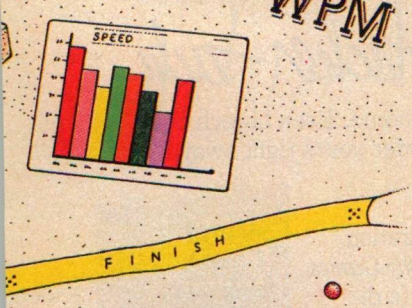


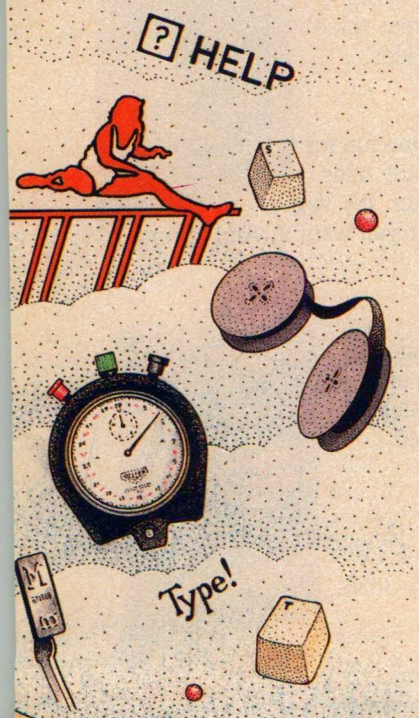


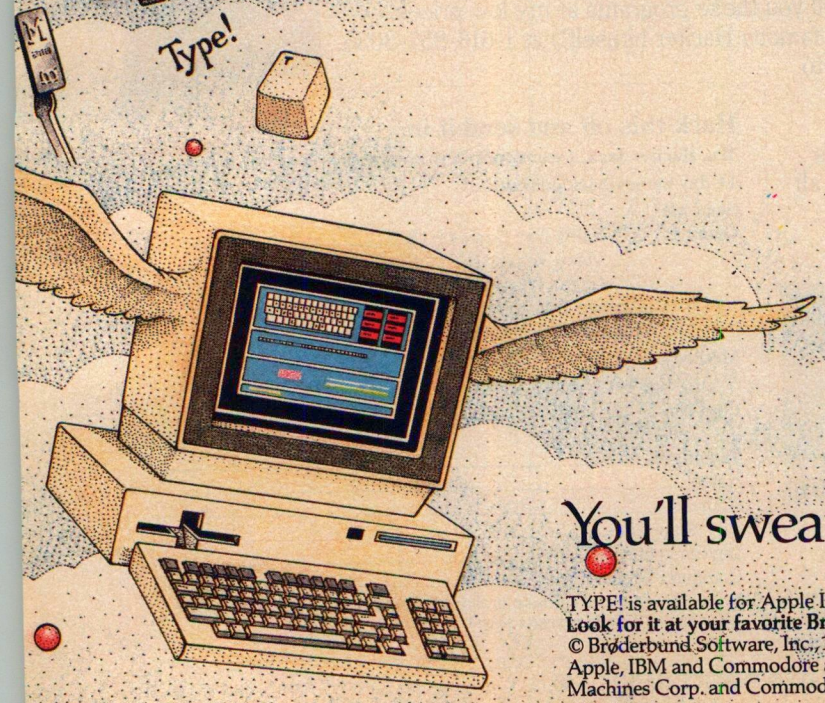


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# APPLEWORKS TEMPLATES

*Instant expertise at bargain prices for applications ranging from tax forms to recipe files*

AppleWorks is a relatively easy program to learn, but knowing how to use it can be a far cry from knowing how to apply it to your business or personal life in practical ways. Although you may fully understand how to enter some spreadsheet formulas or create a database file, you may not have the business training to build a workable cash-flow spreadsheet or accounting system. Templates are a fast way to acquire somebody else's budgeting, accounting, or other expertise and use it in AppleWorks.

A template is simply an AppleWorks file that somebody has created for use by others—it might be a budget spreadsheet, a database file that tracks social activities, or even a word-processing document that contains a common business contract such as a lease or a bill of sale. Because a template is a standard AppleWorks file, you can enter data into it, change the data, or alter the template itself by changing a spreadsheet formula, creating a new database report, or rewriting a line of text in a word-processing file. Many times, you'll find yourself customizing a template to better suit your own needs, but rather than having to design such a file from scratch, you can start with a complete file that performs a specific activity.

In addition to being an attractive solution for AppleWorks users seeking expertise on certain subjects, templates are also the average person's answer to software publishing—a template is a way for experts to resell their knowledge. It's therefore not surprising that most templates for sale have been created by individual AppleWorks users. Rather than seeing the flashy display ads you expect from commercial software, you generally find out about template programs through small advertisements or users' group newsletters. Whatever the method of sale, though, templates are usually a bargain. Some collections of templates can be obtained for less than $10, and even the more advanced ones rarely run more than $100.

**Finding and Choosing Templates**

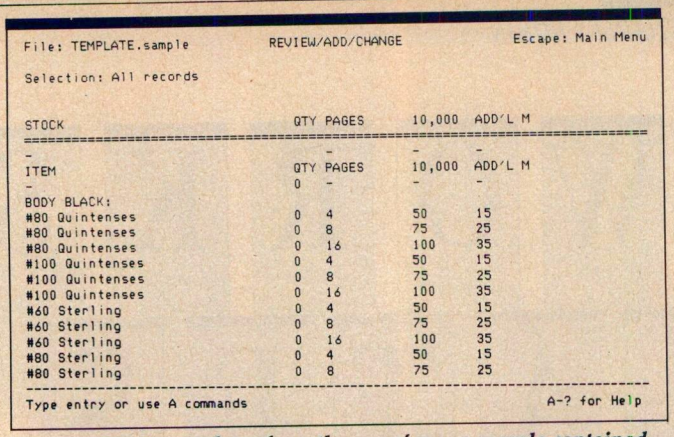
As an AppleWorks user seeking some instant expertise, you should keep several guidelines in mind. First of all, a template is only as useful as its creator has made it. A budgeting template from somebody who doesn't know anything about budgets won't be very useful. Fortunately, most people selling templates have taken pains to ensure that their templates perform in an accurate and useful way.

Beyond the quality of the template, you should consider the fit between the template maker's methodology and your own. Unless you're a complete novice, you probably have some specific ideas about how you want to do accounting, budgeting, or whatever application you have in mind. If your way of doing things differs from the template maker's, you'll either have to modify the template to suit yourself or adjust your work style to the template's method.

Another consideration is the quality of presentation. Some templates are professionally packaged, with documentation that explains their use, and others come with few or no instructions.

Typically, the more complex the template's application, the more likely you are to get documentation with it. Some template makers simply put their documentation into a word-processing file on the template disk; others supply professionally printed instructions.

If you're buying a complex template or set of templates for business finance, accounting, real-estate analysis, or other similar tasks, you should expect some printed instructions. After all, you're buying prepackaged expertise—if you knew enough about real-estate depreciation to use such a template without docu-

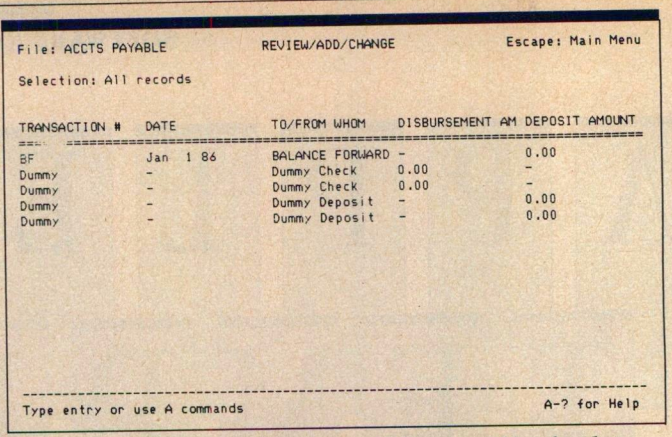


```
File: TEMPLATE.sample          REVIEW/ADD/CHANGE                Escape: Main Menu

Selection: All records

STOCK                          QTY PAGES      10,000  ADD'L M
=================================================================================
-                                  -          -       -
ITEM                           QTY PAGES      10,000  ADD'L M
-                              0   -          -       -
BODY BLACK:
#80 Quintenses                 0   4          50      15
#80 Quintenses                 0   8          75      25
#80 Quintenses                 0   16         100     35
#100 Quintenses                0   4          50      15
#100 Quintenses                0   8          75      25
#100 Quintenses                0   16         100     35
#60 Sterling                   0   4          50      15
#60 Sterling                   0   8          75      25
#60 Sterling                   0   16         100     35
#80 Sterling                   0   4          50      15
#80 Sterling                   0   8          75      25
---------------------------------------------------------------------------------
Type entry or use A commands                                    A-? for Help
```

***Figure 1: Many templates from the users' group sample contained little or no documentation, but even if you find only a few worthwhile templates, you're still getting a good deal.***



```
File: ACCTS PAYABLE            REVIEW/ADD/CHANGE                Escape: Main Menu

Selection: All records

TRANSACTION #   DATE            TO/FROM WHOM     DISBURSEMENT AM DEPOSIT AMOUNT
=================================================================================
BF              Jan  1 86       BALANCE FORWARD  -               0.00
Dummy           -               Dummy Check      0.00            -
Dummy           -               Dummy Check      0.00            -
Dummy           -               Dummy Deposit    -               0.00
Dummy           -               Dummy Deposit    -               0.00

---------------------------------------------------------------------------------
Type entry or use A commands                                    A-? for Help
```

***Figure 2: Many template files look as if they would be simple to create yourself, but in many cases, as with this accounts-payable file, you're really paying for the method by which you use a file.***

mentation, you'd probably create the necessary spreadsheet file yourself.

For this article, *A+* editors requested samples of templates from every advertisement they could find at the time, as well as from a couple of users' groups. The response was heartening, and I had a chance to look at templates for applications ranging from federal tax forms to recipe files, from personal or business financial analysis to general-ledger accounting, from school record keeping to boilerplate business letters, and from checkbook balancing to calendars and encyclopedias of facts. This representative sampling shows there are a lot of different ways to add some instant expertise to AppleWorks.

Apple III owners should note that all the templates this article covers work not only with AppleWorks, but also with III E-Z Pieces, the AppleWorks predecessor for the Apple III, from Haba-Arrays.

**USERS' GROUP TEMPLATES**

One source of templates at particularly reasonable prices is Apple users' groups. Virtually every Apple users' group that has any interest in AppleWorks has some AppleWorks templates for loan or sale. Most of these template packages are barebones products with little or no written documentation, but the price is unbeatable.

**Template Collections**

Our users' group samples were a collection originally supplied by Jim Willis of The AppleWorks User Group (TAWUG) but that came to us from The Big Red Apple Club in Norfolk, Nebraska. Your local Apple users' group undoubtedly has other templates to offer.

The AW11 and AW28 template collections represented the best value of any we looked at—the AW11 set contains 12 diskettes (that's diskettes, not files) full of templates, and the AW28 set has 16 full diskettes.

These two collections include far too many templates to discuss in detail, but here are some examples. The AW28 collection contains some 70 templates, including a checkbook register, teachers' grade book, home budget, net-worth report, profit/loss statement for a small business, amortization calculator, list of big-city area codes, income-property analysis, and federal income-tax estimator.

The templates were created by a variety of different AppleWorks users, so some templates in the collection duplicate all or part of the function of others. One reason for the low price is that these packages make no attempt to anticipate users' needs. Some templates have on-screen documentation, or even separate documentation in a word-processing file, but most of them have no documentation at all (see figure 1).

Jim Willis collected these templates over a long period of time and from users all over the country. Our set even contained what appeared to be personal files belonging to Willis himself, including business letters and a database file of all the TAWUG members. In short, this collection of templates is a bit of a grab bag, but even if you find only a handful of worthwhile templates out of the dozens you get in these collections, you're still getting a good deal.

The Template Collections AW11 ($13.20) and AW28 ($17.60) are available from The Big Red Apple Club, 1105 South 13th Street, #103, Norfolk, NE 68701; written inquiries only.

**Education Templates**

Many school districts that use AppleWorks heavily have developed their own templates for various school-administration tasks. Some districts or regional teachers' organizations have formed AppleWorks users' groups of their own. I looked at a sample school-district template set from Virginia. Check with your own school district or regional teachers' or administrators' organization to see if any templates are available for your specific state or county.

The Special Education Student Information Database template maintains records on special-education students and has four predefined reports for sorting the database by different criteria. It comes with a clear, step-by-step, printed manual. The coding for classifying the students is specific to Chesterfield County schools, but the codes could change to reflect those in any school district. The Student Demerit Record Keeping System is a database file for storing student names, number of demerits, date of infraction, and type of infraction. You can sort this database and extract the data about any one student for copying into a boilerplate letter to the student's parents, which is also supplied. This disk also comes with a clear manual.

The Special Education Student Information Database ($10) and Stu-

dent Demerit Record Keeping System ($10) are available from Helen S. Edens, Supervisor for Computer Education, Chesterfield County Public Schools, 2318 McRae Road, Bon Air, VA 23235; (804) 323-0527.

**Library Templates**

The Apple Library Users Group maintains an Apple Template Exchange. It currently lists about 200 templates that individuals from libraries all over the United States and Canada have contributed. The exchange provides templates on topics such as book catalogs, circulation statistics, overdue items, periodical holdings, and a variety of other areas relevant to librarians.

If you are interested in participating in or receiving information about the Apple Template Exchange, please contact Monica Ertel, Apple Library Users Group, 10381 Bandley Drive, Cupertino, CA 95014; written inquiries only.

## ENTREPRENEURS' TEMPLATES

The majority of templates we reviewed came from the individuals who created them and who advertised their wares through classified ads or small display ads in magazines or users' group newsletters. As you can see from the following descriptions, each individual has some expertise in one or more specific areas (accounting, kitchen management, or school administration, perhaps) and is marketing that expertise in the form of templates.

**Miscellaneous Templates**

Petit Design and Engineering offers four sets of templates with a variety of uses. The Super Grab Bag collection includes ten templates for personal use, including federal tax worksheets for forms 1040 and schedules A, E, and D; a ledger for storing tax deductions; a depreciation calculator; a college-fund calculator; two real-estate-purchase calculators; a disk-catalog maker that prints a list of the files on a disk; and database files for use as shopping and camping-trip lists. The School Bag offers eight templates, including a grade book; a test-scoring template; a calendar; and three trigonometric-function calculators. The Busi-Bag contains six templates, including a spreadsheet that produces simple bar charts from data, a calendar, and three invoice

*Templates are the average person's answer to software publishing—a template is a way for experts to resell their knowledge.*

forms. The Cookbook disk is a database file that includes 40 recipes. These templates are supplied without written documentation, but each file contains clear instructions.

AppleWorks Super Grab Bag ($12), School Bag ($7), Busi-Bag ($7), and Cookbook ($7) come from Petit Design and Engineering, 1344 North 31st Street, Milwaukee, WI 53208; (414) 933-4627.

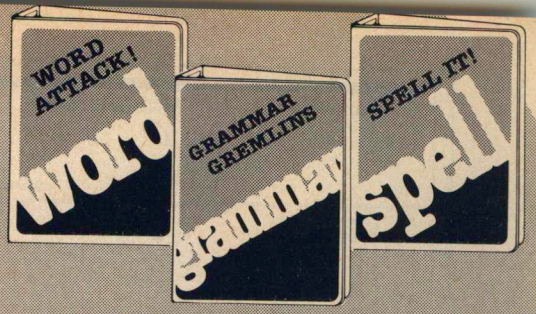
**Application Templates**

Application Templates for AppleWorks comprises six template disks that handle accounts payable, accounts receivable, payroll, financial calculations, investment-portfolio tracking, and storage of personal financial transactions. They come with a money-back satisfaction guarantee. These spreadsheet and database templates form a single-entry accounting system suitable for small businesses. Each module of the accounting system comes with sample printouts. The instructions for each template disk are supplied in a word-processing file on the same disk and are fairly thorough—on most of the disks, the instructions run to about ten pages. This accounting system uses fairly simple files you could create yourself in a few minutes, but the author's method of using these files is where the expertise comes in (see figure 2).

The Application Templates for AppleWorks ($29.95 each) come from Applied Scientific, 416 Arnold, Bozeman, MT 59715; (406) 586-1157.

**Finance Templates**

Business Finance Files for AppleWorks and Personal Finance Files for AppleWorks are collections of files that come with typeset documentation that briefly describes how and why to use each template. The 17 business templates include a break-even analysis, depreciation schedules, a business-income statement, two different inventory-control systems, a return-on-investment analysis, and a forecasting analysis. The 11 personal templates include an amor-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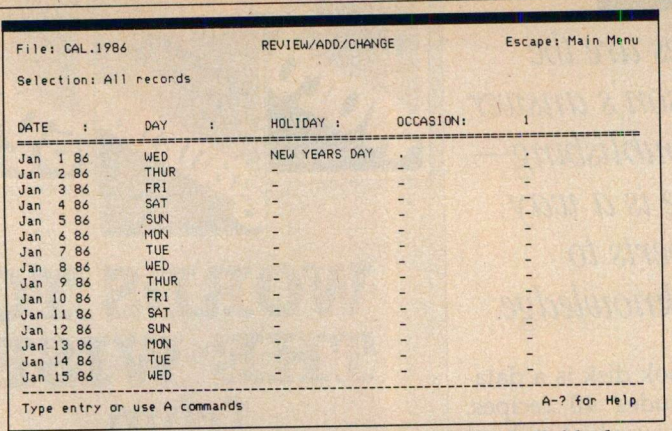
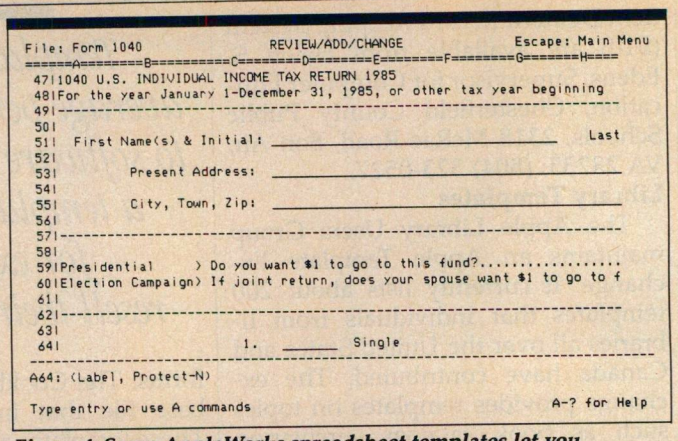


```
File: CAL.1986                    REVIEW/ADD/CHANGE                Escape: Main Menu

Selection: All records

DATE     :        DAY      :        HOLIDAY :        OCCASION:        1
=================================================================================
Jan  1 86         WED               NEW YEARS DAY    .                .
Jan  2 86         THUR              -                -                -
Jan  3 86         FRI               -                -                -
Jan  4 86         SAT               -                -                -
Jan  5 86         SUN               -                -                -
Jan  6 86         MON               -                -                -
Jan  7 86         TUE               -                -                -
Jan  8 86         WED               -                -                -
Jan  9 86         THUR              -                -                -
Jan 10 86         FRI               -                -                -
Jan 11 86         SAT               -                -                -
Jan 12 86         SUN               -                -                -
Jan 13 86         MON               -                -                -
Jan 14 86         TUE               -                -                -
Jan 15 86         WED               -                -                -
---------------------------------------------------------------------------------
Type entry or use A commands                                          A-? for Help
```

***Figure 3: DateWorks is a database file that contains individual records for each day in a year. Each record has several blank fields for recording appointments.***



```
File: Form 1040                    REVIEW/ADD/CHANGE                Escape: Main Menu
======A========B==========C========D========E========F========G=======H====
47|1040 U.S. INDIVIDUAL INCOME TAX RETURN 1985
48|For the year January 1-December 31, 1985, or other tax year beginning
49|-----------------------------------------------------------------------
50|
51|  First Name(s) & Initial: ____________________________________ Last
52|
53|          Present Address: ____________________________________________
54|
55|          City, Town, Zip: ____________________________________________
56|
57|-----------------------------------------------------------------------
58|
59|Presidential     > Do you want $1 to go to this fund?..................
60|Election Campaign> If joint return, does your spouse want $1 to go to f
61|
62|-----------------------------------------------------------------------
63|
64|                        1.  _______  Single
-----------------------------------------------------------------------------
A64: (Label, Protect-N)

Type entry or use A commands                                          A-? for Help
```

***Figure 4: Some AppleWorks spreadsheet templates let you automate preparation of your federal taxes.***

tization calculator, an electronic checkbook register, a mortgage-loan calculator, and two calculators for determining the future value of savings or investments.

You can obtain Business Finance Files for AppleWorks ($19.95) and Personal Finance Files for AppleWorks ($19.95) from Practical Computer Applications, 2323 Tucker Court, Santa Rosa, CA 95401-2374; (707) 579-4866.

**Checkbook Templates**

Checkbook Register and Reconciler comes with four pages of printed instructions and offers five different spreadsheet templates for different levels of checking-account activity. One template tracks up to 53 checks per month, for example, and another tracks up to 250 checks per month. A third tracks checks in up to three categories. The templates handle addition and subtraction of deposits, checks, and bank charges you enter, and produce a balance with which to reconcile your bank statement each month. Many people consider it overkill to use a computer to balance a checkbook, but with this template, the price is right, and the instructions are clear.

Checkbook Register and Reconciler ($7.95) is available from Steinke, 4833 NE 238 Avenue, Vancouver, WA 98662; written inquiries only.

**Calendar Templates**

DateWorks comprises a set of calendars for the years 1986 through 1997. Unlike most other templates, these are available on either 5¼- or 3.5-inch diskettes (the 3.5-inch diskette calendar goes through 1999). This set of database files contains fields for the date, day of the week, holiday (if any), and occasion. The files have several blank fields in which you can enter appointments for any given day. As with many other templates, such files are simple to create, but in this case, David Sachs Associates is supplying the calendar date, day of the week, and any holiday in individual records for each year. Thus, each template file encompasses one year and contains 365 records (one record for each day). Instructions come in a file on the disk (see figure 3).

DateWorks ($19.95) comes from David Sachs Associates, 2274 56th Drive, Brooklyn, NY 11234; (718) 531-5737.

**Real-Estate Template**

Electronic HUD Settlement for AppleWorks is an electronic version of the settlement sheet a real-estate broker uses to inform the buyer of a house how much the loan payment will be, how much the mortgage is, and what the other charges and credits in the escrow will be. A company spokesperson says most of A&B Abstract's sales are to real-estate brokers and attorneys. The printed instructions use Pennsylvania real-estate transactions as examples, but you can modify the template to accommodate different transfer taxes and other formulas from other states.

For Electronic HUD Settlement for AppleWorks ($29.95), contact A&B Abstract Corporation, 4647 North 5th Street, Philadelphia, PA 19140; (215) 750-7550.

**Recipe Templates**

Nonnie's File Box is a collection of files and templates that is, as the company's advertising says, for cooks with AppleWorks. It includes 75 recipe files stored as spreadsheets and word-processing documents. The same recipe files are also stored in database files, so you can sort through the recipe collection for dishes that meet certain criteria. Several shopping-list database files contain some 700 grocery items, which you can select and print into custom shopping lists. The product comes with a 30-page printed manual.

Nonnie's File Box ($24.95) is available from Plume Software, Inc., P.O. Box 2209, Altoona, PA 16603; (814) 942-7058.

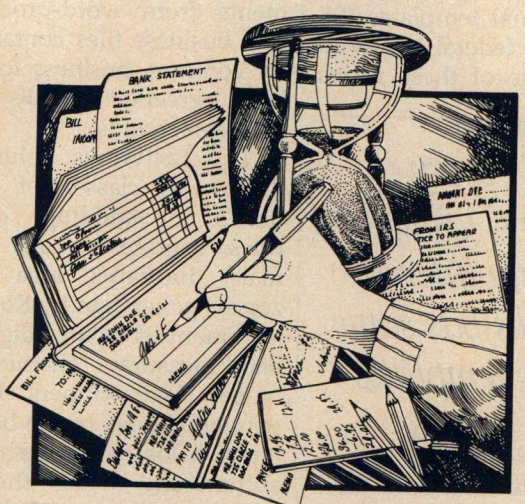
Smart about Apple is a collection of about a dozen personal templates to help novice users get more out of the word-processing formatting features and database features in AppleWorks. The templates come with a 35-page printed manual that clearly explains each template and how to use AppleWorks' word-processing and database commands to change the templates' formats or contents. The word-processing templates are all simply formats: business letters, a research paper (including bibliography and title pages), a babysitter's notepad, and a shopping list. The database files are a name/address/phone file that includes a report format for generating a list of mailing labels, and a simple household accounting system that tracks expenses and income in several different categories and then produces month-end or year-end reports.

You can get Smart about Apple ($49.95) from Jane Hein Interests,

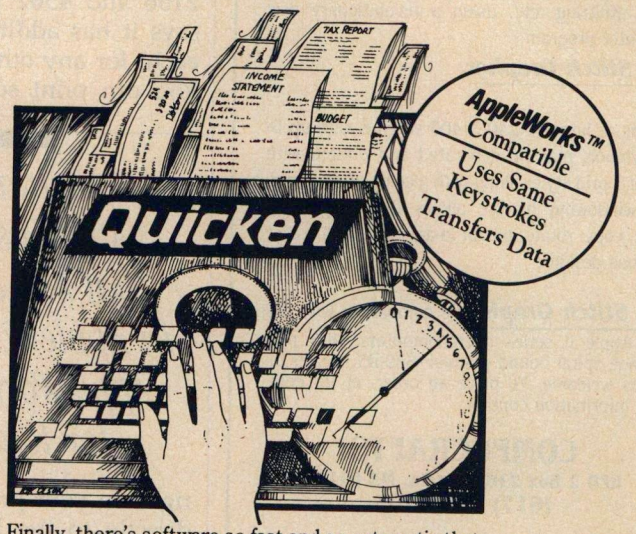
# Free Trial! Call 800 624-8742

(California residents call 800 468-8481)

# End Financial Hassles. $49.




Who doesn't want to rid themselves of the hassles of paying bills, managing finances, and keeping records?

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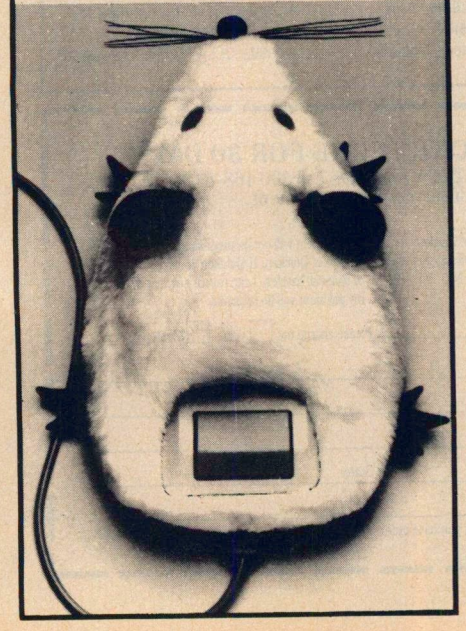


P.O. Box 5057, CB #1, Golden, CO 80401; written inquiries only.

**Tax Templates**

1986 Federal Tax Forms is a set of templates that lets you enter tax information and then calculates and transfers it into the proper place on any of 12 federal income-tax forms, including forms 1040 and 1040A, Schedules A-F, Schedules SE and W, and Forms 2106 and 4562 (see figure 4). SKY says it has additional templates ($5 each) for any other federal tax form. You can print some of these forms right on your printer and send them directly to the IRS—others are not approved as substitutes, so you may have to transfer the data from an AppleWorks-printed form to an actual IRS form. The set of templates also comes with calculators that determine amortization and depreciation. The package lacks printed instructions, but several pages of instructions reside in a separate file on the disk, and each form template has brief instructions as well.

*Virtually every Apple users' group that has any interest in AppleWorks has some AppleWorks templates for loan or sale.*

1986 Federal Tax Forms ($39.95) comes from SKY Computer Resources, P.O. Box 204, Portland, OR 97207; (503) 234-7291.

**REMARKETERS' TEMPLATES**

The templates in this group are wide-ranging collections of applications, created by several different people, that are published or remarketed by one company. These template packages are professionally packaged, with typeset documentation, and the prices tend to be slightly higher than what you'd pay for similar templates from an individual entrepreneur, but better documentation or support from the vendor may justify the price.

**Encyclopedic Templates**

FactWorks consists of three separate packages, each of which contains a disk filled with encyclopedic database and word-processing files. Most of the facts are the sort of things students might need for school or that you might find in record books or encyclopedias, but you'll also find some useful business-type files. With the fact files, you can use your Apple and AppleWorks just as you would an encyclopedia. You can sort through and select information about presidents or other groups of famous people with the database fact files, and you can recall the text of the Gettysburg Address and other famous documents from word-processing files. The business files contain templates for common business forms such as lease agreements, wills, or partnership agreements.

The FactWorks volumes contain dozens of classes of information; here's a sampling: capitalization rules, continents, cats, dogs, mammals, dinosaurs, area codes, time zones, poker hands, Roman numerals, manned space flights, weights and measures, chemical symbols, Nobel Prize winners, World Series winners, bones of the body, airplane types, a loan-amortization schedule, authors and writers, the Declaration of Independence, and the U. S. Constitution (see figure 5). The typeset manual contains instructions and tips about Desktop memory, creating database reports to select certain groups of facts, and adding records to existing fact files. You also get an index that shows all the groups of facts currently available in FactWorks and which volume contains each group.

FactWorks Volumes 1, 2, and 3 ($32.95 each) are from ImagiMedia Software, 16640 Roscoe Place, Sepulveda, CA 91343; (818) 891-3707.

Our sampling of templates from The Q-Mar Group included Business Letters, Teacher's Tools, Personal Financial Management, and Printer's Tools (see figure 6). Each of these products comes with a disk of templates and a complete, typeset manual that explains how to use them.

Q-Mar's lineup includes General Ledger ($89.95); Time Management ($59.95); Printer's Tools ($49.95); Business Letters ($49.95); Business Contracts ($49.95); Personal Financial Management ($49.95); Graphics/Advertising System ($59.95); Homebuilder's Tools ($69.95); Teacher's Tools ($49.95); and CookWorks Mexican, Italian, & Chinese ($32.95 each). The Q-Mar Group is at 5677 Oberlin

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| 64k **MULTIRAM** | 169. | 129. |
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| 576k **MULTIRAM** | 229. | 199. |
| 832k **MULTIRAM** | 254. | 234. |
| **1024k MULTIRAM** | 279. ← ← ← ← ← | |
| 1344k **MULTIRAM** | 419. | - |
| 1600k **MULTIRAM** | 449. | - |
| 1792k **MULTIRAM** | 479. | - |

| | |
|---|---|
| **Apple IIe Enhancement Kit** | **62.** |
| **Cermetek 1200 Baud internal modem IIe/II+** | **184.** |
| **Incomm 2400 Baud external univ. modem** | **359.** |
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| **Accelerator IIe-350% speedup card** | **227.** |
| **Pinpoint Program or Spelling Checker (ea)** | **49.** |
| **ProAPP 10 & 20 Meg Hard Disk Drives** | **Call** |
| **Pico™ Slimline Drive IIc/IIe/II+** | **158.** |
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Ramworks II/Timemaster II H.O./Z-ram II, Flipster, respective trademarks of Applied Engineering, Cirtech. ***Call for RGB Connectors/cables (not included).**

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|---|---|
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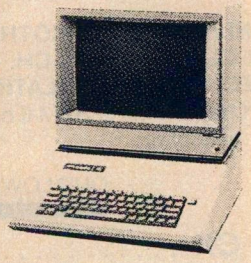

System Includes:

- **Apple** IIe Enhanced
- **Apple** Extended 80 Column Card
- **Apple** Unidisk Drive 5¼"
- **Apple** Drive Controller
- **Apple** Utilities with PRODOS
- **Magnavox** Green Phosphor Monitor
- **Epson** LX-86 Dot Matrix Printer
- **Epson** Adjustable Form Tractor
- **SMT** Printer Interface w/cable
- **Megahaus** Word Processing Software
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- Package of Computer Form Paper
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This System is ideal for the first time computer user, it features the all new Epson LX-86 120 CPS Printer with Near-Letter-Quality Printing. 128K of RAM and even includes Megahaus' Word Processing! Another Complete Ready-To-Run System!

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- **Apple** IIc Green Monitor
- **Apple** IIc Monitor Stand
- **Apple** Tutorial Disks
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- **Epson** Tractor Feed Option
- **Orange Micro** Grappler C Printer Interface
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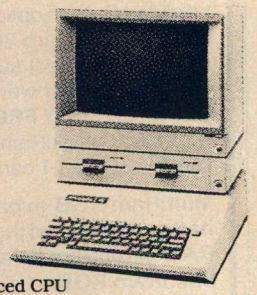

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- **Apple** DuoDisk Controller
- **Apple** PRODOS Operating System
- **Apple** Color Monitor IIe
- **Applied** Engineering RamWorks III 256K
- **Apple** Imagewriter II Printer
- **Thirdware** FingerPrint+ Printer Interface
- **Apple** Imagewriter Ribbon-Black
- **Apple** Imagewriter Ribbon-Color
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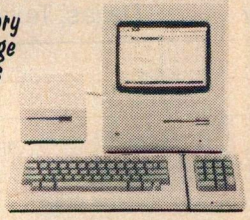
*Includes all cables*



System Includes:

- **Macintosh** Plus 1 Megabyte
- **Macintosh** Mouse
- **Macintosh** 800K External Drive
- **Apple** Imagewriter II
- **Apple** Macintosh Printer Cable
- **Microsoft** Word for Macintosh
- **Maxell** Diskettes — Box of 10
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|---|---|---|
| **Apple Computers** | | |
| Super Serial Card | $149 | $ 99 |
| UniDisk 5¼" Disk Drive | $289 | $209 |
| UniDisk 3.5 with Catalyst Software | $399 | $319 |
| Unidisk 3.5 Controller | $ 69 | $ 59 |
| Apple IIe CPU 64K | $899 | $649 |
| Apple Color Monitor IIe | $379 | $299 |
| Apple Color Monitor IIc | $379 | $299 |
| Apple IIe Mouse | $149 | $125 |
| Apple IIc Mouse | $ 99 | $ 85 |
| Apple Enhancement Kit | $ 70 | $ 50 |
| **Misc.** | | |
| Laser 128 Computer | $499 | $399 |
| AST SprintDisk 256K | $299 | $209 |
| Kensington System Saver | $ 89 | $ 69 |
| Kensngtn Mac Sys. Saver | $ 99 | $ 69 |

| Description | Suggest List | Our Price |
|---|---|---|
| **Applied Engineering** | | |
| RamWorks III 256K | $219 | $179 |
| RamWorks III 512K | $269 | $209 |
| RamWorks III 1 Meg | $369 | $279 |
| RamFactor 256K | $239 | $189 |
| RamFactor 512K | $289 | $219 |
| RamFactor 1 Meg | $389 | $289 |
| RGB Option | $129 | $109 |
| Transwarp | $279 | $229 |
| Z-RAM 256K | $329 | $269 |
| Z-RAM 512K | $389 | $309 |
| Z-RAM 768K | $449 | $349 |
| Z-RAM 1 Meg | $599 | $449 |
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| **Printers** | | |
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| Description | Suggest List | Our Price |
|---|---|---|
| **Disk Drives** | | |
| Maple ½ height IIe | $199 | $ 99 |
| Maple ½ height IIc | $199 | $105 |
| Gamma ½ Height IIe | $199 | $149 |
| Gamma ½ Height IIc | $199 | $149 |
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| Magnavox Green Monitor | $149 | $ 99 |
| Magnavox Amber | $149 | $ 99 |
| Taxan 620 RGB | $549 | $399 |
| **Modems** | | |
| Apple Personel Modem with cable | $429 | $319 |
| Hayes Micromodem IIe | $199 | $149 |
| Hayes Smartmodem 300c | $239 | $169 |
| Promethius IIc | $119 | $ 89 |
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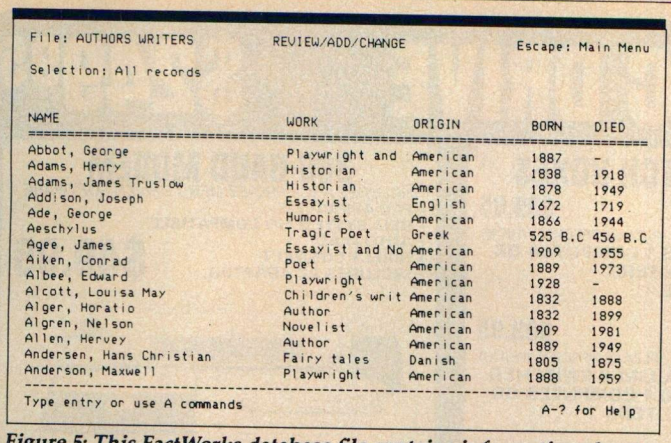


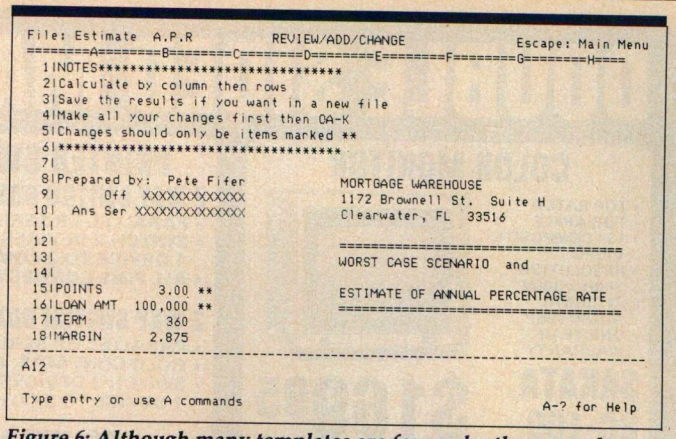
File: AUTHORS WRITERS REVIEW/ADD/CHANGE Escape: Main Menu

Selection: All records

| NAME | WORK | ORIGIN | BORN | DIED |
|---|---|---|---|---|
| Abbot, George | Playwright and | American | 1887 | - |
| Adams, Henry | Historian | American | 1838 | 1918 |
| Adams, James Truslow | Historian | American | 1878 | 1949 |
| Addison, Joseph | Essayist | English | 1672 | 1719 |
| Ade, George | Humorist | American | 1866 | 1944 |
| Aeschylus | Tragic Poet | Greek | 525 B.C | 456 B.C |
| Agee, James | Essayist and No | American | 1909 | 1955 |
| Aiken, Conrad | Poet | American | 1889 | 1973 |
| Albee, Edward | Playwright | American | 1928 | - |
| Alcott, Louisa May | Children's writ | American | 1832 | 1888 |
| Alger, Horatio | Author | American | 1832 | 1899 |
| Algren, Nelson | Novelist | American | 1909 | 1981 |
| Allen, Hervey | Author | American | 1889 | 1949 |
| Andersen, Hans Christian | Fairy tales | Danish | 1805 | 1875 |
| Anderson, Maxwell | Playwright | American | 1888 | 1959 |

Type entry or use A commands A-? for Help

***Figure 5: This FactWorks database file contains information about presidents, sports figures, explorers, authors and writers, and other famous figures.***



File: Estimate A.P.R REVIEW/ADD/CHANGE Escape: Main Menu

```
1 NOTES**********************************
2 Calculate by column then rows
3 Save the results if you want in a new file
4 Make all your changes first then OA-K
5 Changes should only be items marked **
6 **********************************
7
8 Prepared by:  Pete Fifer          MORTGAGE WAREHOUSE
9       Off  XXXXXXXXXXXXX          1172 Brownell St.  Suite H
10  Ans Ser XXXXXXXXXXXXX           Clearwater, FL  33516
11
12                                  ================================
13                                  WORST CASE SCENARIO  and
14
15 POINTS        3.00 **            ESTIMATE OF ANNUAL PERCENTAGE RATE
16 LOAN AMT  100,000 **             ================================
17 TERM          360
18 MARGIN       2.875
```

A12

Type entry or use A commands A-? for Help

***Figure 6: Although many templates are for use by the general public, some, such as this printer's job-estimating worksheet from the Q-Mar group, are intended for specific industries.***

Drive, Suite 100, San Diego, CA 92121; (619) 455-7513.

**Spreadsheet/Database Templates**

HabaTemplates is a collection of 54 home and business templates for use with the AppleWorks spreadsheet and database programs. Most of the database templates are simple files that anyone with even a rudimentary knowledge of AppleWorks could create in a matter of minutes, such as an address file, a simple calendar file, and book- or record-collection files. The spreadsheets, on the other hand, cover more sophisticated applications such as rental-property management, sales forecasts, break-even analyses, time-and-materials job estimating, and expense reporting. The documentation is sparse—the accompanying booklet contains a list of the template names with one- or two-sentence descriptions of each template's function.

HabaTemplates ($29.95) is available from Haba-Arrays, 6711 Valjean Avenue, Van Nuys, CA 91406; (818) 994-1899.

**Wide Array**

This sampling of templates should give you an idea of the range of ready-made applications available for AppleWorks users. Their variety and reasonable price make them an invaluable source of prepackaged expertise. ✚

---

*A+ contributing editor Charles Rubin is the Author of* Command Performance: AppleWorks, AppleWorks, *and* The Endless Apple, *all from Microsoft Press.*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The **National AppleWorks Users Group (NAUG)** is an association of AppleWorks users. **NAUG** members share information, hints, suggestions and ideas about AppleWorks through a monthly newsletter. Here is a partial list of articles that appeared in the September issue of the ***Forum:***

- How to find "lost" AppleWorks files.
- How to use non-Apple printers with AppleWorks.
- How to configure AppleWorks for different interface cards.
- How to eliminate unwanted characters on your printouts.
- How to run AppleWorks on a hard disk network.
- How to save & use standard formats & boilerplate text.
- How to use dates in a data base.
- How to navigate around large spreadsheets.
- ...And lots more.

**NAUG** shares an electronic bulletin board and maintains a library of public domain disks. A one-year **NAUG** membership costs $24. We will refund the balance of your dues if you are ever dissatisfied.

**National AppleWorks Users Group**
**Box 87453, Canton, MI 48187**

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____Enclosed is $3 for a sample **NAUG** newsletter.

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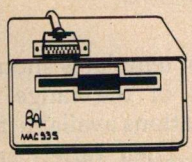

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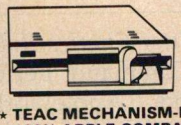

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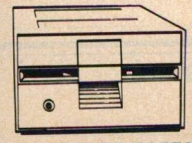

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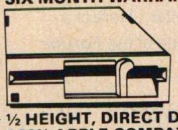

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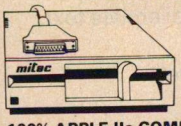


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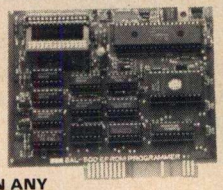

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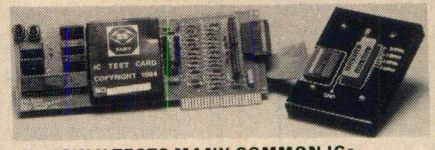

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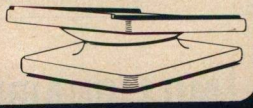

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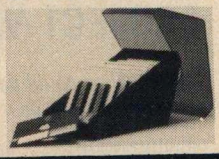

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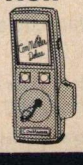

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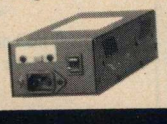

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CIRCLE 167 ON READER SERVICE CARD

BY DAVID D. THORNBURG

# A NEW APPLE FOR TEACHER

## *Will the Apple IIGS change educational computing?*

In January 1985, I had the pleasure of addressing the Florida Instructional Computing Conference in Orlando. During my talk, I said that the Macintosh was the perfect computer for children in elementary through high school because it was so intuitively easy to use. I argued that the Mac should be focused toward children in kindergarten and that the Apple IIe should be used by college students who had the patience to work witha more complex user interface.

The audience laughed, and an Apple representative stood at the back of the conference room with arms crossed in disapproval.

At that time, Apple was trying to position the Macintosh for the college and business market, and my insistence on demonstrating it across the country to educators in the K–12 domain ran counter to that plan.

I have always argued that the best way to lead a parade is to grab a flag and run to the front of the crowd, though. Stories about MacPaint users as young as 15 months are too numerous to be ignored. The fact that the Macintosh interface is so intuitive that toddlers can master it is a high compliment to its designers, and many observers believe that the popularity of the Macintosh outside its target market will open new opportuniies for Apple.

**What's Wrong with the IIe?**

The traditional Apple II line, based on the 6502 microprocessor, with its ability to address only 64K of RAM directly, is nearly ten years old. That people have been able to create exciting applications for this machine—one that technology has long since eclipsed—is absolutely amazing.

The creation of intuitively simple user interfaces requires a lot of computational horsepower, however, and the speed and computational power of the IIe just don't provide enough steam to pull it off as well as we might like. Much of the glamour of the Macintosh derives less from what its programs do than from how they appear to their users. The extensive use of graphics, windows, and computational "objects" (such as icons that "know" what they are supposed to do when you click on them with a mouse) requires lots of computation. Applications such as MousePaint, MouseWrite, and Instant Pascal aside, providing such features is a lot to ask from a 6502-based computer.

*The GS in the name stands for* graphics *and* sound, *areas where the IIGS leaves its predecessors in the dust.*

**The K–12 Macintosh?**

If the Macintosh is so much easier to use than other computers, why haven't schools pawned off their Apple IIe computers to install rooms full of Macs? The answer is simple. First, they've had to face the traditional chicken-and-egg problem of software. No educational-software developers are going to support the Macintosh until it penetrates the schools in large numbers. Second, Apple doesn't encourage schools to purchase the Macintosh except as an administrators' machine. Third—and I'm not sure how important this factor really is—the Macintosh doesn't have color. Finally, none of the

**ILLUSTRATION BY** SHANNON KRIEGSHAUSER

schools' Apple II software runs on the Macintosh.

The recent introduction of the Apple IIGS—the GS in the name stands for *graphics* and *sound*, areas where the IIGS leaves its predecessors in the dust—is a welcome response by Apple to about 90% of these issues. First and foremost, the IIGS runs all Apple IIe software, so no one has to throw away many programs. Also, the IIGS uses a 16-bit processor; has 256K of built-in RAM; and can take advantage of mice, menus, windows, and icons—allowing its new programs to have the look and feel of those on the Macintosh without compromising speed or performance.

*The high resolution of the machine will give IIGS educational software its greatest opportunities.*


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**Sounds and Colors**

Those who've created programs that use sound for computers such as the old Atari 800 or the Commodore 64 are shocked when they find out that the Apple IIe creates sounds by clicking a tiny speaker on and off at different rates. Compared with the multivoice sound capabilities of computers such as the Atari and Commodore, the original Apple II sound-producing ability is primitive.

On the other hand, even the multivoice sound chips of the Commodore and Atari pale in comparison to the sounds that dedicated synthesizers such as the Yamaha DX-7 or the Ensoniq Mirage produce. This disparity is one reason why educators who use Apple IIs and are serious about music have flocked to such synthesizers as a means to let their sound-poor computer generate spectacular music.

In apparent penance for its past sins of omission, Apple Computer, Inc. has jumped from the primitive to the exquisite in one leap. Rather than having to confine themselves to clicking a speaker on and off, IIGS programmers now have access to an Ensoniq synthesizer chip with its own dedicated 64K of RAM. This chip allows the creation of 15 independent voices, ranging from speech to music. You can even store sounds sampled from elsewhere and play them back while other programs are running on the computer.

The IIGS graphics present a similar pleasant shock to old-time Apple II users. Rather than having to worry about the smearing that occurs when they place two "wrong" colors next to each other, IIGS programmers have a rich palette of 256 hues, each having 16 shades or luminance levels. So you get 4096 colors in all, of which up to 16 (depending on the display resolution) can go on each scan line. To let you fully appreciate these rich colors, the Apple IIGS works with an RGB monitor as well as the composite-video monitors that are common in many schools.

**Does It Matter?**

Although the sound and color capabilities of this computer make it ideal for programs in music and art, I really question the need for these features in an elementary classroom. In the early primary grades, color can be quite important, but most classrooms I have visited have only monochrome displays, and these function quite well for most educational software.

Good color monitors are expensive, and they are likely to stay that way for the foreseeable future. I see color as an option that is desirable but not essential for most educational applications of computers.

If color isn't important, high resolution is, however. The first thing most people notice about Macintosh images is how "real" the characters look. The ability to render pictures accurately depends on the display resolution, which is influenced by the amount of RAM available in the computer. Because the IIGS comes with 256K of RAM, 32K is not too much to dedicate to the display, and it provides an ultimate display resolution of 640 × 200 dots in any of four colors. The IIGS gives you this graphics mode, as well as 320 × 200 dots in 16 colors, along with all the old Apple II display modes.

I believe that resolution is more important than color and that this aspect of the machine will give IIGS educational software its greatest opportunities.

An issue related to resolution is that of gray scale. Dots on the Macintosh and the original Apple II screen are either on or off—these machines have no gray-scale capability. Consequently, they have to use halftones, dot patterns like those used in photographs reproduced in newspapers and magazines, in order to create the illusion of shading. The Apple IIGS, on the other hand, allows 16 levels of gray, making possible the display of higher-quality black-and-white pictures than the ones you can get with the Macintosh.

I expect that libraries of scanned images will become available to let users of the IIGS take advantage of this feature.

**Mice in the Classroom?**

If the display resolution and user interface will make the IIGS popular in the classroom, I think the mouse will not. I spent ten years at the Xerox Palo Alto Research Center (birthplace of many ideas that found their way into the Macintosh), and we found the mouse to be the most unreliable part of our computer systems. Heavy Mac users have confirmed that the mouse is problematic. If you think that an accountant has trouble keeping a mouse clean, just think about a poor mouse in a classroom filled with chalk dust being used by a child with fingers full of strawberry jam!

Educational-software developers would be wise to provide nonmouse alternatives in their software, and third-party hardware vendors need to provide a robust kidproof alternative to the relatively fragile and dirt-sensitive mouse.

**Multiple Keyboards**

In a move that points toward some novel applications, Apple has introduced the Apple DeskTop Bus as a standard input port for the keyboard and mouse. At first glance, this name might appear to be a fancy designation for a place to put the keyboard cable, but the bus has features that are ripe for outside development.

The DeskTop Bus is controlled by a dedicated microprocessor that reads the status of the keyboard, mouse, and any other device connected to the bus. You can connect as many as 16 keyboards to the bus at one time, which opens the opportunity to create multiuser activities centered on one computer, and the bus is also ideal for the creation of new input devices, especially for students with physical or learning disabilities.


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CIRCLE 146 ON READER SERVICE CARD


**Mixed Disks**

I have speculated that, sooner or later, Apple will move to the 3.5-inch disk drive as the new standard for all its products. In deference to the installed base of older Apple IIs (it is hard to ignore 2.5 million machines!), the IIGS works with both 5¼- and 3.5-inch disk drives. Software specific to the IIGS will appear in the 3.5-inch format, and the optional 5¼-inch disk drive allows use of software written for the older models.

In a break from tradition, Apple designed the new Apple II disk drives so that they can be chained together—you can connect up to four external drives.

**Upgrades**

In a move designed to win friends, Apple is providing an upgrade program that allows installation of the IIGS innards in the Apple IIe housing. This upgrade path should appeal to schools because it allows inexpensive adoption of the new machine. The IIGS works with existing IIe software and peripheral cards, so the conversion involves no hidden expenses. This upward conversion path, similar to the one Apple provided when it announced the Mac Plus, sets Apple apart from other companies. When was the last time IBM made a similar offer?

**What about the IIe?**

Some may think that the announcement of the IIGS is the death knell for the Apple IIe. I would have thought so too, except that Apple has also announced a new memory upgrade for the IIc and new pricing for both the IIe and IIc, thus assuring a comfortable home for them in the product line.

I think Apple wants to let the marketplace decide which machines to keep. In the long term, I expect the IIc, IIGS, and Macintosh Plus to be the survivors. Because the IIGS has the expandability of the IIe and the user interface of the Macintosh, Apple has created a middle-of-the road machine with few compromises.

Will the IIGS change educational computing? By maintaining compatibility with existing Apple II software, it already has. ✚

---


*David Thornburg is a frequent contributor to this magazine. He is the designer of Calliope for the Apple IIe; IIc; Macintosh; and, now, the Apple IIGS. You can reach him in care of A+, 11 Davis Drive, Belmont, CA 94002.*

# When you really want to see how Apple works...

## AutoWorks *by Alan Bird*

### (AUTOmatic AppleWORKS)

AutoWorks adds to AppleWorks several important time-saving features including mail merge, file organizing, macros, new AppleWorks commands and mouse control.

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AutoWorks allows you to use your MOUSE to make menu selections and to quickly scroll through and position the cursor in your document, data base file or spreadsheet. This feature alone is worth the price of AutoWorks.

With AutoWorks' powerful MACROS, you can automatically enter hundreds of keys including AppleWorks commands with a single keystroke. You can, for example, print out one or several reports by entering one key. The macros are easily updated instantly using the AppleWorks word processor. New AppleWorks commands are also included with macros such as forward delete, word delete, jump to beginning or end of line, etc. With macros you can even create your own AppleWorks commands.

The Disk Librarian helps you keep track of all your disk files. It reads ProDOS file information directly from your disks into an AppleWorks data base file where you may search for certain files and disks, sort on various file characteristics, find disks with free space, etc.

AutoWorks is compatible with AppleWorks versions 1.1, 1.2, and 1.3.

***AutoWorks***

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## FontWorks *by Mark Simonsen*

### Good-looking Printing for AppleWorks

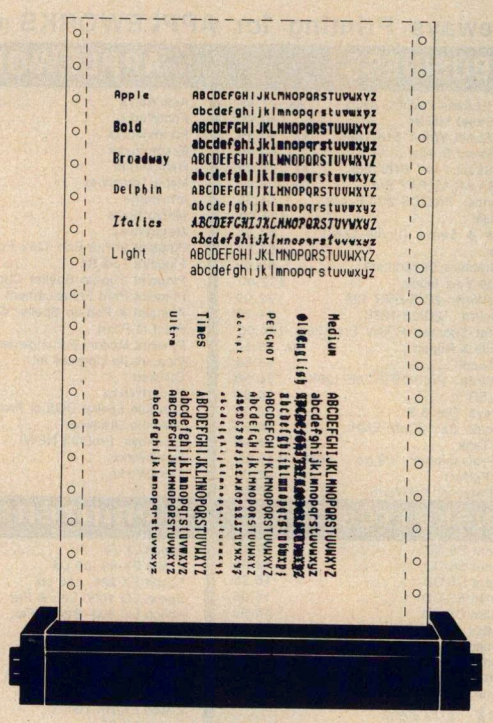
Now you can print your AppleWorks files in a variety of typestyles. FontWorks reads your Appleworks files directly (no need to save them in a different format) and prints them with the typefaces you choose. You can even print your files sideways — great for those wide spreadsheets.

There are no complicated commands to learn. FontWorks incorporates the same easy-to-use menu style as AppleWorks.

Choose from 15 typefaces of various styles and sizes, including Broadway, Delphin, Old English, Peignot, Script, Times, and many more. You can use up to 4 of these typefaces at one time when printing your AppleWorks files. And FontWorks comes with its own Font Editor, allowing you to customize our typefaces or create your own.

FontWorks works with any Apple IIe or IIc and is compatible with most popular dot-matrix printers, including ImageWriter, Epson, and Okidata.

Note: Owners of previous versions of FontWorks may upgrade for FREE by returning their original FontWorks (disk only) to The Software Touch.

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CIRCLE 137 ON READER SERVICE CARD

BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

# A LITTLE BASIC ANIMATION

## *Using Applesoft shapes to make your computer images move*

For the benefit of our new readers, let's cover some of the basics of shapes and shape animation on the Apple II family of computers. Shapes are among the most useful tools an Apple artist has. A shape is an image, stored as data, that you can retrieve and draw over and over again on the screen. Commonly employed in animation, shapes are useful as repeating elements in a graphic. We've used shapes for title screens, as icons on menus, as tokens on game boards, and even to put text onto a screen.

**Block Shapes**

You can construct shapes as blocks or vectors. Most commercial animation programs, such as Movie Maker and Take One, use block shapes. These shapes are cutouts of a picture, rectangular blocks of pixels. When the shape moves, the computer draws and redraws the entire block. Block shapes are fast and efficient and can be as colorful as the artist wants.

Applesoft BASIC doesn't allow block shapes, so you must have special routines to use them. Most animation systems provide these routines along with instructions on how to access them from Applesoft. You can also manipulate block shapes with many of the ampersand packages we described in our May 1986 column. To these, add the Chart and Graph Toolbox from Roger Wagner. In addition to block-move instructions, this package has some useful graphic tools plus a clever front end, the Workbench, which allows you to pick and choose only the routines you need. The package includes double-hi-res versions of most everything.

*Figure 1: Applesoft shapes are vector shapes that you can rotate, scale, and draw in any of Apple's colors. You can use Applesoft shapes in your own BASIC programs.*

**Vector Shapes**

Unlike block shapes, Applesoft shapes are stored as vectors (lines that have direction and length). The shape appears as a block of pixels on the screen, but Applesoft creates this screen image from your vector definition of a shape in a shape table. To make the shape move, Applesoft draws and redraws the vectors. As your computer calculates new line positions, it can scale and rotate objects (see figure 1). The most popular commercial utility for manipulating vector shapes is Fantavision (see review in *A+*, February 1986). Fantavision is an impressive and powerful tool for playing with objects and transformations. Its main drawback is that you can't use it to manipulate objects from your own programs.

*With a little programming creativity, you can use Applesoft shapes for limited animation.*

**Applesoft Shapes**

You can use Applesoft shapes in your own BASIC programs. Because they are a part of Applesoft, these shapes don't demand lots of extra memory. A popular commercial utility package for working with Apple shapes is Shape Mechanic from Beagle Bros. This package includes a useful utility, Shape Capture, that was not present in its former incarnation, Apple Mechanic. With Shape Capture, you define a rectangular area of any hi-res screen and capture it. The program converts the block of pixels

on the screen into the vector descriptions necessary for recreating the block. Once you've captured it, the shape is a standard Applesoft shape.

**Programming Applesoft Shapes**

Once you've defined a shape, you use two simple pokes to tell Applesoft where the shape is stored in RAM, and a Draw command puts the shape onto the screen. With a little programming creativity, you can use Applesoft shapes for limited animation. One technique is to draw a shape, erase it, draw it in a new location, erase, and so on.

The strongest objection to Applesoft shape animation is lack of speed. Because of the vector-to-screen transformation, BASIC is slow at putting a shape onto the screen. The larger the shape, the slower the process. You can't do much to speed up the animation, short of purchasing an accelerator card (see *A+*, August 1986.) Another common objection is the flicker that results as the shape erases itself as it moves. Let's see some of this animation in action. Fire up your Apple and enter the following program:

```
10 GOSUB 500
20 POKE 232,0:POKE 233,96
30 HCOLOR=3:ROT=0:SCALE=1
40 HGR:POKE -16302,0
50 FOR X = 10 TO 269
60 XDRAW 1 AT X,100:REM DRAW
70 XDRAW 1 AT X,100:REM ERASE
80 NEXT X
90 END
500 FOR I = 0 TO 10:READ T
510 POKE 24576+I,T:NEXT I
520 RETURN
530 DATA 1,0,4,0
540 DATA 39,55,55,53,37,37,0
```

This program describes the shape, a dot, in DATA statements. You can substitute a shape table by including a BLOAD instruction (10 PRINT CHR$(4);"BLOAD tablename,A24576") and deleting the subroutine (lines 500–540).

**Flicker-Free Animation**

You can eliminate the flicker by never letting viewers see the erasing. The secret: Take advantage of the Apple's two display screens and erase on the hidden screen. A few simple modifications, and your shape will stop flickering:

```
10 GOSUB 500
20 POKE 232,0:POKE 233,96
30 HCOLOR=3:ROT=0:SCALE=1
40 HGR2:HGR:POKE -16302,0
50 FOR X = 10 TO 269 STEP 2
60 POKE 230,64:POKE -16300,0
70 IF X=10 THEN GOTO 90
80 XDRAW 1 AT X-2,100:REM ERASE
90 XDRAW 1 AT X,100:REM DRAW
100 POKE 230,32:POKE -16299,0
110 IF X=10 THEN GOTO 130
120 XDRAW 1 AT X-1,100:REM ERASE
130 XDRAW 1 AT X+1,100:REM DRAW
140 NEXT X
150 END
500 FOR I = 0 TO 10:READ T
510 POKE 24576+I,T:NEXT I
520 RETURN
530 DATA 1,0,4,0
540 DATA 39,55,55,53,37,37,0
```

The pokes in line 60 tell BASIC to draw on page 2 (POKE 230,64) and show page 1 (POKE -16300,0). Line 100 is just the reverse. Lines 70 and 110 skip the first erasure; after all, there is nothing to erase the first time through. Try the program without these two lines.

**Going Further**

Generalizing these techniques to construct a multiframe animation


# Ribbon Land

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that uses Applesoft shapes is not difficult. You must keep track of the frame being drawn, so that you're erasing and drawing with the right frame. Such a program is beyond the scope of this column, but if you send us a stamped-self addressed envelope, we'll send you a listing.

For more comprehensive coverage of Apple shapes and using shapes in animation, see "Shaping Up," *A+*, August and September 1984, and "Making It Move," *A+*, April and May 1985. We also deal with both topics in our book, *Apple Graphics: Tools and Techniques.* ✚

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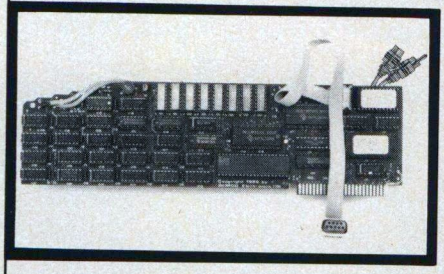

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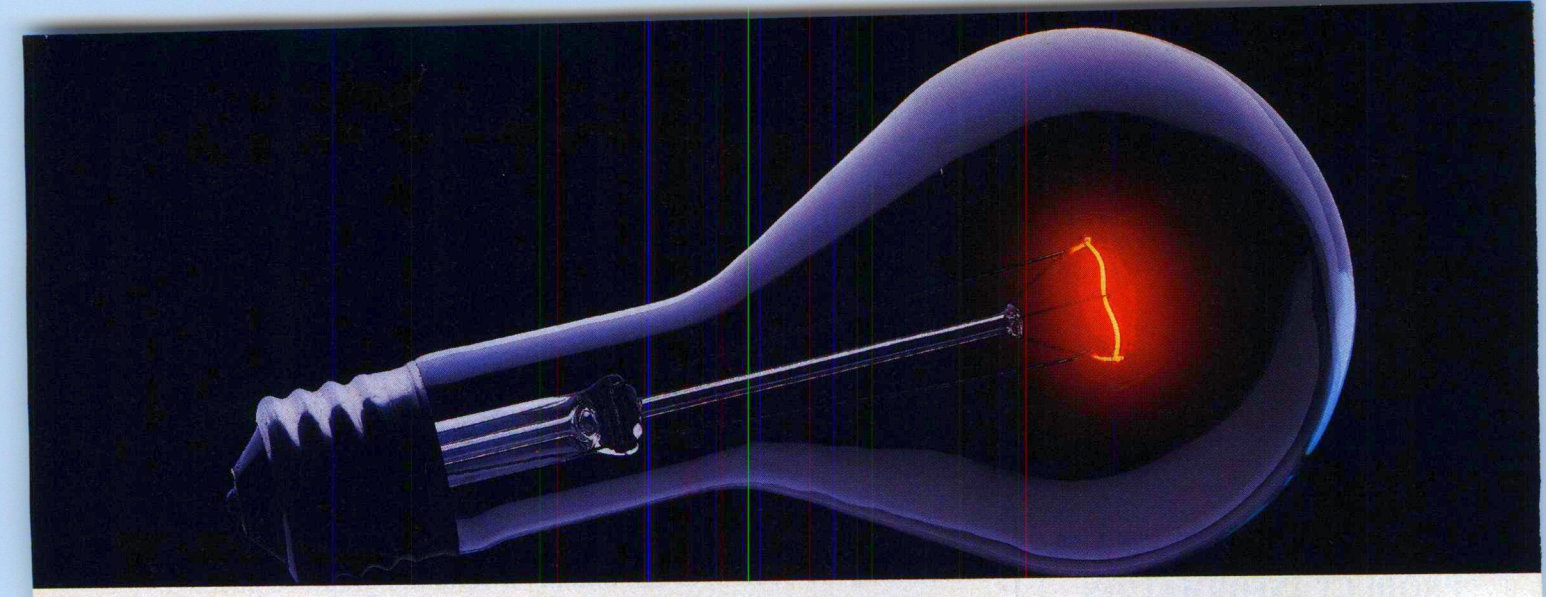

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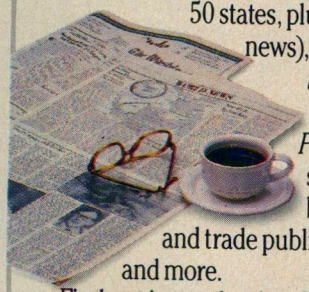

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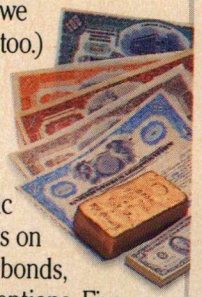

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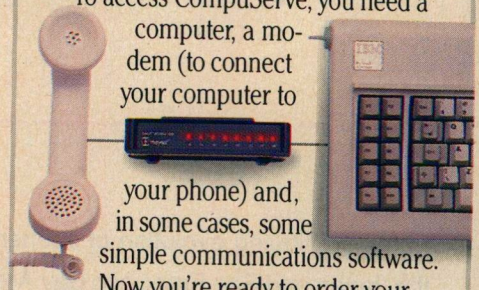

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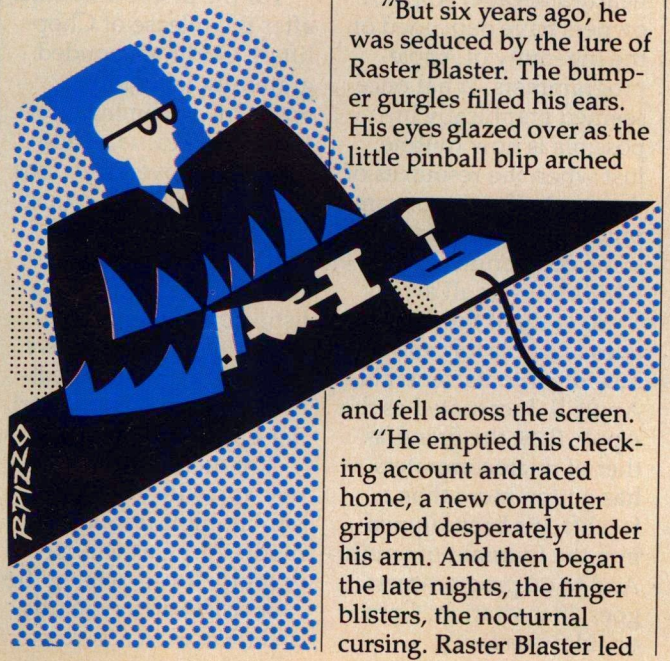
# GamePort

BY BOB LINDSTROM

*Hot tips and trends, pace-setting games, and interviews with top creators are just some of what you'll find in this column every month.*




## WHAT AM I DOING HERE?

Welcome to another episode of The Computer People's Court. The defense is about to deliver its closing argument in a game-addiction case:

"Judge Wapner, Mr. Bob Lindstrom's software addiction is hopeless but not harmful. Don't sentence him to life behind an executive workstation, endlessly recalculating spreadsheets.

"Lindstrom hasn't always had this white-knuckled attachment to joysticks.

"But six years ago, he was seduced by the lure of Raster Blaster. The bumper gurgles filled his ears. His eyes glazed over as the little pinball blip arched and fell across the screen.

"He emptied his checking account and raced home, a new computer gripped desperately under his arm. And then began the late nights, the finger blisters, the nocturnal cursing. Raster Blaster led to Zork I, which led to Gorgon, then on to Ultima, Olympic Decathlon, Computer Bismarck.

"And then came the Mac.

"And Pinball Construction Set.

"Lindstrom decided that computers could be as fertile and inventive a form of amusement as motion pictures were. Perhaps, like the movies, computer entertainment could grow into an art form. He began a game-crowded vigil watching for the day that the computer would give birth to its *Citizen Kane* or, even, *Friday the 13th, Part 15: Jason Draws Medicare.*

"Lindstrom is not a hardened fanatic. He is just a man who found creativity where he didn't expect it. I rest my case."

In a moment, Judge Wapner returned with his decision.

"Counsel, in light of your eloquent summary, I have decided not to commit Mr. Lindstrom to a six-month term of keyboard dusting at a nationally known accounting firm. Instead, I sentence him to write a monthly column on computer games for a national magazine. Perhaps in this way others may learn from his obsession. Case dismissed."

## WHAT ARE YOU DOING HERE?

The spouse and the kids are in the living room watching "Miami Vice," and the boss is down in the coffee shop.

Can we talk?

We understand each other here. We know what goes on when everyone thinks we're writing that term paper or finishing that flowchart or preparing for tomorrow's presentation to the board.

Aliens, watch out! Right?

So why keep it under wraps? Take a look at the byline over this article. I went public, and so can you. As long as game playing is taking so much of your valuable time, you might as well get some publicity out of it.

Here's how. Write to me and let the world know the results of your computer-entertainment research project. (Sounds prestigious when you put it that way, doesn't it?)

Found any unusual Easter eggs? Got an awesome high score that you can substantiate? Uncovered any ingenious ways to cheat? Or do you just need to air your game-playing problems to the nation at large? This is your chance.

Andy Warhol predicted that in the future everyone would be a celebrity for a minute. One lousy minute? What does he know? Get your name into *A+* and become a part of publishing history.

Address all letters, comments, scores, and cheat techniques (especially those cheat techniques) to GamePort, *A+* magazine, 11 Davis Drive, Belmont, CA 94002.

## WHAT'S THIS COLUMN DOING HERE?

No matter how many great games crowd store shelves, you want to know what's new. So does this column.

Each month, GamePort will get a first look at the hot contenders; the pacesetters; and, occasionally, the also-rans of entertainment software.

What's more, since good games are made, not born, GamePort will also talk to the creators whose imagination and expertise keep taking Apple sound and graphics into new territory.

And then there're gaming trends, design shortcomings, playing tips, and undercover programming feats. (Ever booted the back side of Karateka?)

## APPLE IIGS INFLUENCE

They could have spelled it IIgs—little g, big S. Sound may outdo the graphics in the new Apple IIGS.

As one software publisher put it, "We finally convinced Apple that sound and graphics are important. Now if we could just convince them that moving graphics are important."

Ears will pop and eyes bug out at the audiovisual enhancements of the IIGS, at least for those who haven't seen some of the competition. Artists, both graphic and musical, probably will love the new machine. The dramatic improvements over the IIe and IIc include multivoice digital sound and 16-color graphics.

Sound is the main event here. The ability to use digitized sonics will bring lifelike explosions and crashes and bleeps and buzzes to Apple games. The sound of video devastation will be more devastating than ever. Musical scores will use real instruments and lifelike sound effects to add genuine atmosphere and excitement to computer entertainment. The 16 colors and wide color palette of the GS will offer artists shading and detail previously undreamt of in the Apple II world. The GS will inspire truly artistic graphic adventures.

The remaining question, however, is how effective the GS will be with animated graphics. The 16 GS colors that can create such impressive still pictures aren't quite as versatile when it comes to moving images around the screen.

One GS programmer points out that the new graphics mode does not allow page flipping, a standard Apple animation technique. The computer can provide more detailed pictures than can its predecessors. These higher-resolution pictures require more computer calculations, but since the IIGS has only a little more calculating speed than do the IIe and IIc, use of the new graphics might actually slow down animation.

Games that don't require high-speed action will quickly be able to take advantage of the GS's advanced graphics, however. For instance, MicroProse has announced that its Silent Service submarine-combat simulation will be converted for the GS.

It seems inevitable that animation will come. For nearly a decade, Apple II owners have depended on the ingenuity of Apple programmers. What once seemed graphically impossible is now routine. Just when the resources of the Apple II series of computers seem exhausted, some code-crunching whiz blows us all away.

So, a tip of the CPU goes to Apple for pumping new life into its venerable Apple II. Incarnated as the Apple IIGS, the grandfather of microcomputers has gotten more than a facelift. It's been dipped into the fountain of youth. And to GS programmers goes an invitation: Come on, blow us away.

## DAN GORLIN RETURNS

Even without the new IIGS graphics mode, however, the Apple II series still has uncharted potential, witness Dan Gorlin's new game, Airheart.

In 1982, a few desperate little computer guys waving at a helicopter made Dan Gorlin a star. His incredibly successful Choplifter! was one of the first computer amusements to bring humanity and pathos to animated blips and established Gorlin as a master of Apple graphics.

But what could he do for an encore?

The rumor mill got busy after Choplifter! appeared. Stories spread about Gorlin's experiments with three-dimensional animation. The grapevine sprouted tales of demo screens in which an airplane soared around a 3-D island. Dolphins leapt and dived in the ocean below, and the reflection of the plane glimmered in the water.

For the first few months after the release of Choplifter!, Gorlin responded gratefully to inquiries about his upcoming effort. Later, he became a trifle testy when overeager fans prodded him for the next magnum opus.

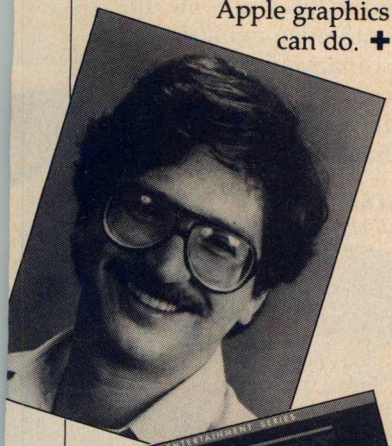
The prodding is over. Airheart has been published by Brøderbund Software. It doesn't have the airtight plot and real-life tensions of Choplifter!, but oh-those-graphics.

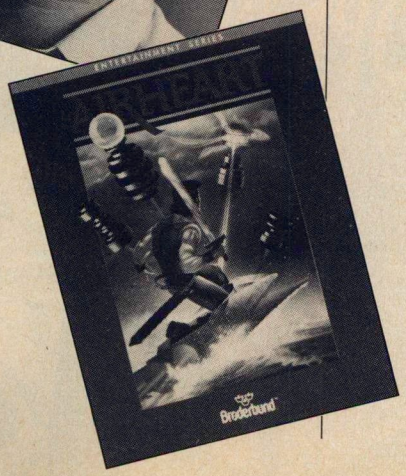
Produced entirely in the Apple IIe and IIc's double-high-resolution mode, Airheart will have graphics lovers wiping the drool off their keyboards. A little man in a rocket-

powered rubber raft flies over a 3-D ocean in which whitecaps occasionally break the surface. He leans into the corners, and the reflection of his tiny boat shimmers below him—sound familiar? He blasts island-bound beacons toward his adversaries and releases a mob of twisting, spinning opponents to help him overcome the creatures. Then, victorious, he hops to the island, stretches on his bathing cap, and dives into a watery tunnel.

Airheart is full of delightful detail. The art is so rich, the animation so smooth that (no offense) it's hard to believe it's all happening on our Apples.

Airheart won't break your heart the way Choplifter! could. Its technosorcery plot goes more for arcade action than for poignance. When you see our flying hero struggling inside a transparent bubble, though, you'll change your mind about what Apple graphics can do. ✚






# Reviews

**RAMBO: FIRST BLOOD PART II**
*Mindscape*

**EUROPE ABLAZE**
*Strategic Studies Group*

**THE ANCIENT ART OF WAR**
*Brøderbund Software, Inc.*

**LITTLE COMPUTER PEOPLE DISCOVERY KIT**
*Activision, Inc.*

**AUTODUEL**
*Origin Systems, Inc.*

## BLOOD FROM MY DISK DRIVE

Down, but not yet out, I struggle to reach the keyboard, driven ever onward by a desire, or perhaps a madness, to do whatever it takes to win. No remorse. No regrets.

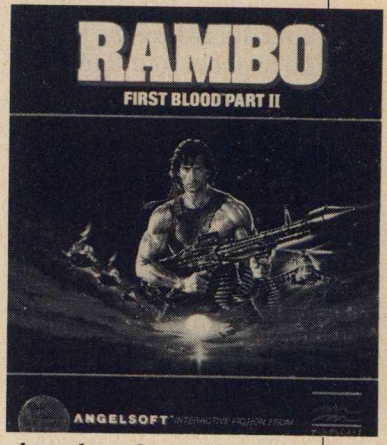
My fingers curl around the keys, and weary eyes fix on angry pixels. Slowly, deliberately, I start to type.

"I'm comin' ta get ya, Mindscape. I'm comin' to get YOU! I need a clue to complete my mission. You're gonna give it to me, you hear? You can't hide. I'll find you. I'm comin' ta get YOU!"

When I find you, the one responsible for the outstanding adaptation of the movie *Rambo: First Blood Part II* as an interactive-fiction game, I'm going to pump your hand up and down. And then I'm going to pump you full of lead from my AK-47 assault gun for creating a devious and deadly text-adventure game.

As John Rambo, the tougher-than-nails commando who makes G.I. Joe seem like a pansy, you must parachute into Vietnam, rendezvous with a contact at an abandoned Buddhist temple, and search for U.S. servicemen still held prisoner by the Vietnamese. The only problem is that someone's tipped off the Vietnamese, and half the communist army is after you.

Rambo: First Blood Part II is one of the most difficult adventure games I've played. Perhaps I shouldn't admit this, but two hours of my life passed me by as I struggled to overcome the first




obstacle, a Soviet helicopter that strafes 12 Rambos per hour.

This is no namby-pamby adventure. You can't just stroll in, pick up a clue or two, and solve the puzzle. You must be as tough, as mean, as cunning as John Rambo if you expect to find POW/MIAs.

Rambo: First Blood Part II excels at capturing the essence of the movie. Meticulous descriptions bring the full panoply of jungle sights, sounds, and smells to your imagination. It draws you quickly into the situation and rewards those actions that employ Rambo's skills and tricks.

I must still pick a nit about Mindscape's parser structure, though. It is not as sophisticated as those of Infocom and Synapse/Brøderbund. Text adven-

tures revolve around translating thoughts into actions, and although the Mindscape parser structure is good, it could stand improvement.

Not that my thoughts were particularly productive. In fact, I had to cheat: I rented the movie and played it on a VCR. Infused with fresh insight, I attacked the game again and proved that discretion is often the better part of valor—well, at least in the case of Soviet helicopters. Snipers and land mines are another foe altogether, but I did reduce the kill ratio to about four Rambos per hour.

Please refrain from performing a soliloquy on mindless violence or arguing against reviving the Cold War mentality. Rambo: First Blood Part II is a game based on a movie. Obviously, your opinion of the game will mirror your feelings about the film.

The game captures the situation; the tension; the conflict; and, indeed, the spirit of the movie. It is you against the commies in a brutal, deadly contest. To win, you must steel yourself into becoming an efficient fighting machine like John Rambo.

And that's all I want: to win. That's what all the adventurers want: to win. But somebody doesn't want us to win. You know who? Mindscape. Mindscape doesn't want us to win. So I'm comin' ta get ya, Mindscape. I'm comin' to get you! Before the game gets me.

*Russ Lockwood*

**RAMBO: FIRST BLOOD PART II**
*Mindscape*
*3444 Dundee Road*
*Northbrook, IL 60062*
*(312) 480-7667*
**LIST PRICE:** *$39.95*
**REQUIRES:** *Apple II Plus, IIe, or IIc and one disk drive; or Macintosh, 512K RAM*
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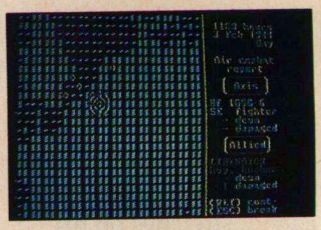
## BOMBS AWAY

In the fiercest air battles of World War II, Germany and England fought for air supremacy. These battles involved various aircraft, including the single-engine Spitfire, the multiengine Super Fortress, dive bombers, and new jet-propelled fighters.

Europe Ablaze is a program that simulates the strategic bombing of the allies and the defense of the coast of England. Not another shoot-'em-up game, Europe Ablaze emphasizes strategy and is best suited for players who enjoy historical simulations.

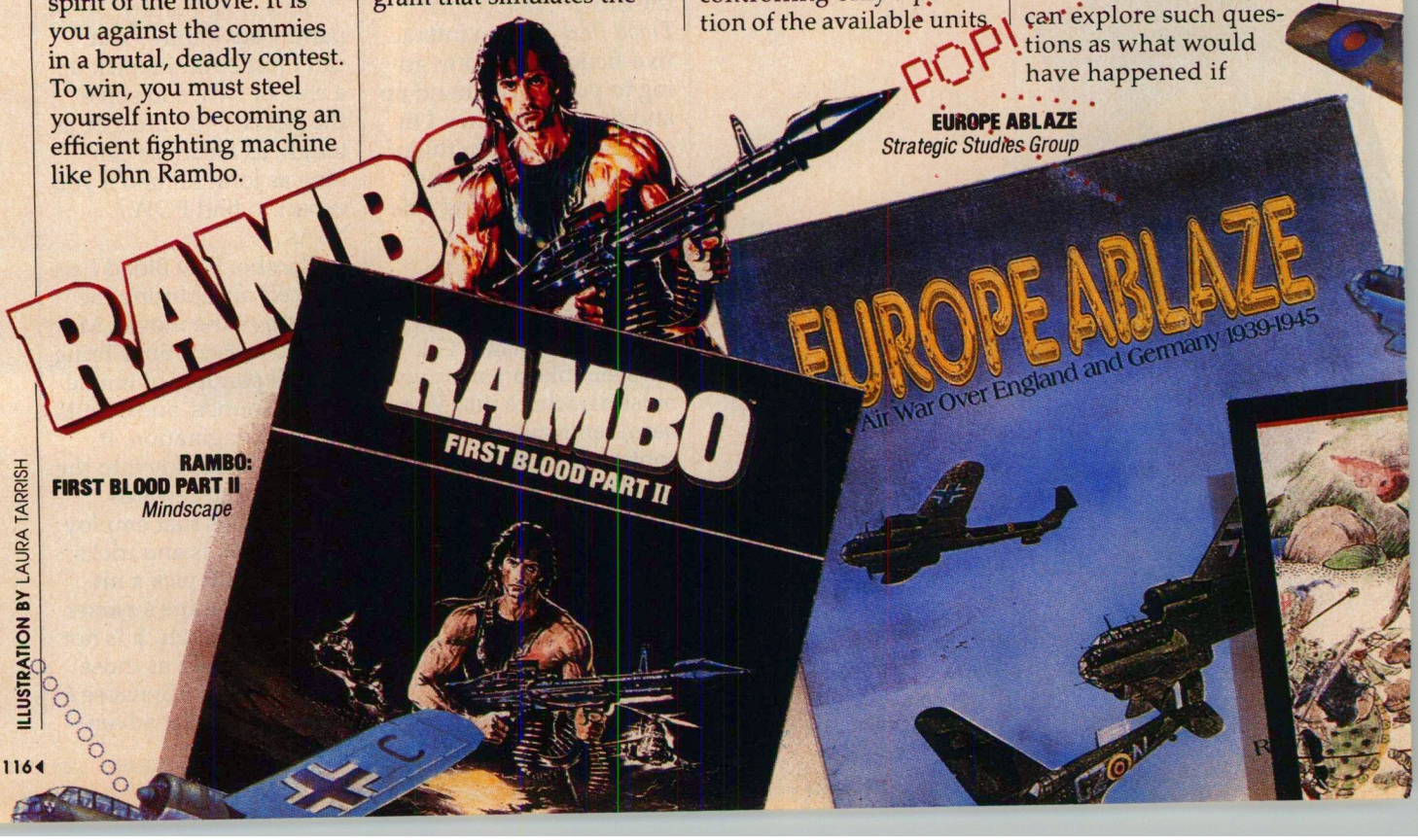
Rather than treating the air battles as one grand campaign covering the war years, Europe Ablaze presents three scenarios: "Their Finest Hour," "Enemy Coast Ahead," and "Piercing the Reich." If you play all three, you will have covered 1939–1945.

Mastering the information in the program's manuals and 23 menus may seem daunting, but an introductory tutorial helps familiarize you with the ins and outs of commanding an air fleet. Once you have a basic understanding of the game system, you will find that playing Europe Ablaze is simple but that mastering its subtleties is challenging. You can vary the game's complexity by controlling only a portion of the available units. The game is at its most complex when you control the Commander-in-Chief, who sets strategic objectives for the Air Commanders, who can also be player-controlled. At this level of play, the



pace is fast and furious, so until you fully understand the game system, you might want to assume control of only one or two Air Commanders.

Part of the Europe Ablaze package is a Game Design program, which lets players create their own scenarios. To design your own game, you create everything from the terrain to the base locations to the type of aircraft on the base—you can even define new types of aircraft. This program lets you come up with many what-if scenarios in which you can explore such questions as what would have happened if




**RAMBO: FIRST BLOOD PART II**
*Mindscape*

**EUROPE ABLAZE**
*Strategic Studies Group*

ILLUSTRATION BY LAURA TARRISH

Germany had invented jet aircraft any earlier.

Europe Ablaze is an excellent historical simulation of the strategic air battles of World War II. The manuals are well written, and you can learn the game in a few trial runs. Its speed of execution is impressive, as is its error checking, which ensures that invalid actions cannot occur. All in all, Europe Ablaze is another winner from the Strategic Studies Group, destined to become a classic.

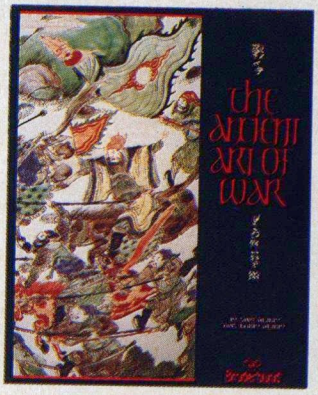
*Richard L. Mataka*

**EUROPE ABLAZE**
*Strategic Studies Group*
*Distributed by Electronic Arts*
*1820 Gateway Drive*
*Suite 200*
*San Mateo, CA 94404*
*(415) 571-7171*
**LIST PRICE:** *$49.95*
**REQUIRES:** *Apple II, II Plus, IIe, or IIc; 64K RAM*
CIRCLE READER SERVICE NO. **371**

## MEET THE GENERALS

Nearly 2400 years ago, Sun Tzu, an extraordinarily successful general of Wu, committed his ideas on the purposes and methods of armed conflict to writing. A respected Chinese classic, the translated *Art of War* has inspired such disparate practitioners of warfare as military commanders, chess masters, and now computer-game designers. Called The Ancient Art of War, Brøderbund's ambitious simulation seeks to provide war-gamers with both strategic and close-up tactical control of their forces.

In each of 11 preset scenarios, your opponent may be any one of eight famous generals—from Athena, Alexander, and Caesar through Napoleon and Geronimo. Each is different, so although Alexander is most dangerous in open terrain, Geronimo is at home in the mountains and forests, and so on. Aside from requiring adjustments in player strategies, this variety amounts to an effective leveling scheme. Sun Tzu is said to "understand every aspect of war" and




does, in fact, demolish all but very skilled players, but Athena is insanely aggressive and easy to outflank. Whomever you face, you achieve victory by capturing enemy flags or eliminating all hostile forces.

You fight each campaign in War on a two-screen, vertically scrollable map showing terrain along with any bridges, forts, or villages. Black and white soldier figures (a little larger than 40-column-format letters) locate friendly and enemy squads. Directing a unit's movement is just a matter of clicking on it and tracing a route with the mouse. Curiously, even though the game has four speed settings, you will find no option for simply stopping action to study the situation. Add the need to click on squads individually for size and composition data, and the result is less-than-easy access to The Big Picture.

The game's scenarios incorporate a multiplicity of strategic factors. Besides plains and hills, terrain features include forests, mountains, and bodies of water. Food sources, supply lines, enemy positions, and reinforcements are additional considerations. An excellent built-in designer package makes it a snap to construct and save entire new scenarios of your own.

Each combat unit comprises up to three types of

# Captain's Log . . . War Date 10.01.44

Enhanced Version Available For New Apple IIgs!

"Captain's Log, October 1, 1944. 0250 Hours. Fleet submarine USS Hammerhead proceeding Southwest at cruising speed. Our mission: intercept enemy convoy off the coast of Borneo. Disperse and destroy."

"0300 Hours. Two hours until dawn. Radar picks up convoy, escorted by two destroyers. We believe that one of the enemy's valuable cargo ships is part of convoy formation."

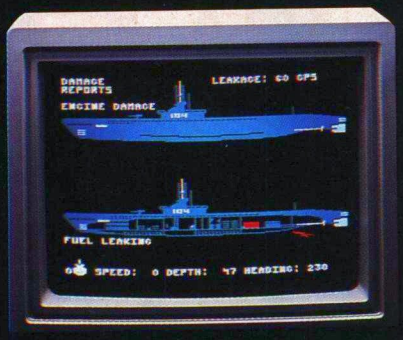
"0400 Hours. Lookouts on the bridge. Target identification party reports one cargo ship, 4,000 tons, troopship of 10,250 tons, with two *Kaibokan*-type escorts. Moving into attack position."

*Tandy 1000/IBM PC Jr. screens shown*

"0500 Hours. Sound General Quarters! Battle stations manned. Preparing for torpedo run. Gauge Panel OK. Periscope OK. Charts and Attack Plot Board OK. All mechanical systems OK."

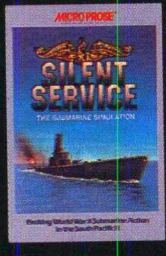
"0525 Hours. Torpedo rooms report full tubes forward and aft. Battery at full charge for silent running. We hope water temperature will provide thermal barrier to confuse enemy sonar."

"0600 Hours. We are at final attack position. Convoy moving at 10 knots. Target distance decreasing rapidly . . . Crash Dive! Escorts have spotted us and are turning to attack! Rig to run silent."




"0700 Hours. Depth charged for one hour. Some minor damage, but repair parties at work. Destroyer propeller noises receding. We'll come to periscope depth for our return punch."

"0715 Hours. Torpedo tubes 1, 2, 3 fired. Two destroyers hit and sinking. One of the enemy's last cargo ships coming into 'scope view — an ideal target position. On my mark . . . Fire Tube 4! Fire 5!"




"Superb" raves Scott May in *On Line*, "strategic intensity and heart-pounding action have rarely been merged this successfully." *Analog* calls it flatly "the best submarine simulation so far." *Compute* comments "Silent Service's detail is astonishing." Join the more than 150,000 computer skippers who have volunteered for **Silent Service**, the naval action/tactics simulation — from MicroProse.

Silent Service is available for Commodore 64™ 128™, Amiga™, Apple II family, Atari XL/XE, Atari ST, IBM PC/PC Jr, and Tandy 1000, at a suggested retail price of $34.95 (Atari ST and Amiga, $39.95).

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Available from your local retailer. If out-of-stock, contact MicroProse directly for further information on our full range of simulation software, and to place Mastercard/Visa orders.

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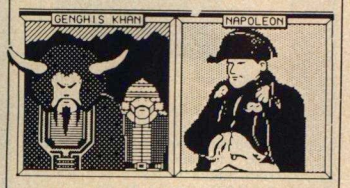
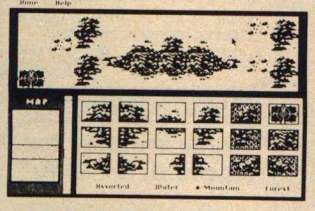
soldiers. Agile barbarians have an edge against archers, archers against the knights, and knights against barbarians. Each squad may have up to 14 members, with the number of units (friendly plus enemy) limited to 20. You set composition, forma-




tion, and marching speed individually in the Squad window, which also indicates "condition" and food supply.

Any contact with an enemy squad enables the Zoom option, which allows you to direct your unit's tactics. In superbly illustrated scenes, archers fire, barbarians pound, knights hack, and troops drop like flies.

The Ancient Art of War incorporates elements of




mobile attack, armor, and distance weaponry. Explicit menus and first-rate documentation quickly move you into the fray for campaigns that can span minutes, hours, or even days. Complex, yet guaranteed not to gather dust on your shelves, this one is right on target for wargamers of every stripe.

*Jeff Hurlburt*

**THE ANCIENT ART OF WAR**
*Brøderbund Software, Inc.*
*17 Paul Drive*
*San Rafael, CA 94903-2102*
*(415) 479-1170*
**LIST PRICE:** *$44.95*
**REQUIRES:** *Macintosh*

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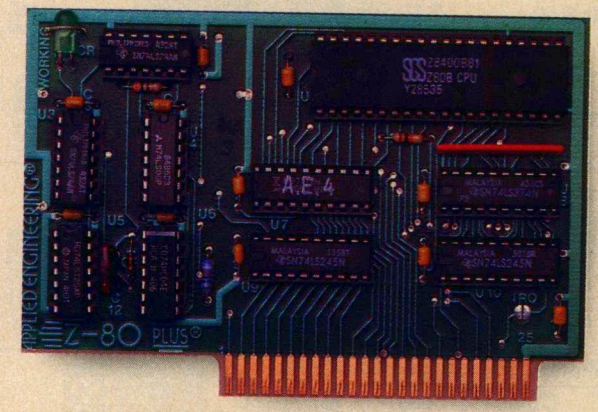
## AN ASTONISHING DISCOVERY

Sure I was skeptical. I mean, who wouldn't be? Humanlike beings living inside computers? The very idea! Since I'm an I'll-believe-it-when-I-see-it type, I poked and probed inside my Apple, looking for those Little Computer People I'd heard about. Soon I became intimately familiar with every circuit and chip, but I swear I never saw any beings, humanlike or otherwise.

But when I booted my new disk, thus becoming part of Activision's Little Computer People Project, there one was! No, that's not quite right. For the sake of scientific accuracy I should report exactly what happened. When I booted the disk, I saw a two-and-a-half-story furnished house equipped with many modern conveniences. Soon the doorbell rang. Twice. Suddenly the front door opened, and a little man walked in. Couldn't have been more than an inch and a half high. Slowly, carefully, he went from room to room, floor to floor. Looking. Inspecting. Checking things out. And then without even the slightest indication that anything displeased him, he walked right back out the front door. Aghast, I called out, "Come back! Don't leave yet!" After a few agonizing moments, he returned, this time with his dog. I breathed a sigh of relief; apparently he liked what he'd found and was back to stay.

Activision's research team has been spearheading the investigation into this phenomenon, and from all the data that it's gathered so far, it seems


# With Z-80 Plus,® run CP/M®—the largest body of software in existence.




*Now, get two computers in one, and all the advantages of both.*

Enter the CP/M world with the new Z-80 Plus card from Applied Engineering, and introduce your Apple IIe® or II+® to the thousands of CP/M programs. Only the Z-80 Plus comes standard with the new 5.0 software, the most advanced system ever for running CP/M programs.

The new 5.0 boasts advanced features like built-in disk emulation for popular memory expansion boards, boosting both system speed and storage capacity. And menu-driven utilities that let you get to work faster. The Z-80 Plus also lets you run older CP/M programs—all the way down to Version 1.6 (2.2 is the most popular).

The Z-80 Plus is the only card on the market capable of accessing more than 64K. If you have an extended 80-column card, all 128K is usable. And if you have RamWorks, RamFactor, or an Apple memory card, up to 1088K is available.

Each Z-80 Plus comes with our CP/M Ram Drive software, enabling an extended 80-column card, RamWorks card or other standard memory card to work as a high-speed Ram disk which runs CP/M software up to *twenty times faster.* So packages like WordStar and dBASE II run at blinding speed.

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**P.O. Box 798, Carrollton, TX 75006**
**(214) 241-6060**

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# QUALITY COMPUTER PRODUCTS FOR APPLE II, II+, *IIe*, *IIc* and Macintosh*

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*Serving the Computer Enthusiast Since 1974*
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## 48K Motherboard
for Apple II+
Fully populated and operating with the Apple-Soft ROM (Refurbished)
*LIMITED QUANTITIES*
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## Joystick
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## Universal 256K Printer Buffer
for Apple II, II+, *IIe*, *IIc*, and Macintosh
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## APPLE* Compatible Cards
FOR APPLE II, II+ AND *IIe**
*ALL CARDS ON SALE!*

### 128K RAM Card**

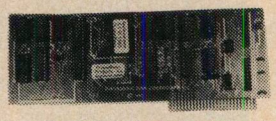
Jameco ELECTRONICS
*Four Key Software Programs!*
RAM Disk!

The **JE868** is functionally compatible with the Apple II language card and can be utilized with most software as a 128K Card. The JE868 requires no modifications to your Apple computer. Four key software programs are included: Utilities, diagnostics, demos, and RAM disk emulators for DOS 3.3, CP/M and Apple Pascal. Complete with instructions.

**JE868** (Expand-A-RAM) . . . **$99.95**

### Applesurance Diagnostic Disk Controller Card

PROMETHEUS PRODUCTS • INC

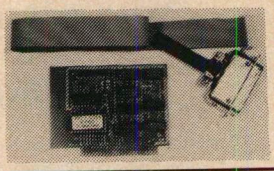


The **JE877** serves as a diagnostic tool, an assurance/maintenance tool and a dual disk drive controller. The JE877 will verify and check the operating hardware of your system each time you turn on your Apple II, II+ or *IIe*.* Test your RAM, ROM, CPU, and disk drives. Diagnostic routines may be cancelled at the touch of a key. Complete with instructions.

**JE877** (DRV-1/Applesurance II) . . . **$59.95**

### Parallel Printer Card

Jameco ELECTRONICS



The **JE880** Printer Interface board is an intelligent interface to most of today's popular dot-matrix graphics printers. The JE880 is fully compatible with Apple CP/M, Apple Pascal (or FORTRAN), and most other operating systems and software packages available for Apple II, II+ and *IIe*.* The JE880 is shipped configured for the Centronics standard. Advanced text printing features include: video screen echo ON or OFF, auto/disable linefeed after carriage return, set/clear the 8th bit of the output data, set left margin, and more! Complete with instructions.

**JE880 (PRT-1). . . . . $49.95**

### Parallel/Serial Buffer Card

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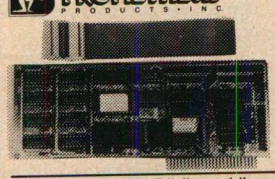

The **JE883** provides the user with up to 64K of additional or buffered memory (18 pgs. of information). Using the parallel jumper cable supplied, the JE883 will attach to the JE880 (above). Parallel Card needed for operation. The JE883 includes a standard parallel input with both parallel and serial (RS232) buffered outputs. With these features you may access and buffer information to two types of printers (one serial, one parallel) simultaneously. Complete with instructions.

**JE883 (P/S Buffer). . . . . $69.95**

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## APPLE™ Compatible 5¼" Disk Drive and Controller Card for Apple II, II+ & *IIe**

- Belt-driven • 143K formatted storage
- Color matches Apple Computer
- Works with Apple Controller or other Apple-compatible controllers (JE875)
- Complete with connector — just plug into your disk controller card
- 35 tracks • Size: 6"W x 3½"H x 8-9/16"D • Weight: 4¼ lbs.

**ADD-514** (Disk Drive) **$129.95**
**JE875** (Controller Card) **$49.95**

## APPLE™ Compatible 5¼" Half-Ht. Disk Drive for Apple II, II+ & *IIe**

- Direct drive • 143K formatted • 35 tracks • Super quiet • Works with Apple Controllers or other compatibles (JE875) above • Complete with connector-just plug into your controller • Size: 5¾"W x 1⅝"H x 8"D • Weight: 4 lbs.

**ADD-12. . . . $119.95**

## APPLE™ *IIc* Compatible 5¼" Half-Ht. Disk Drive

- Same specs as ADD-12 (above) except no controller necessary.

**ADD-IIc. . . . $129.95**

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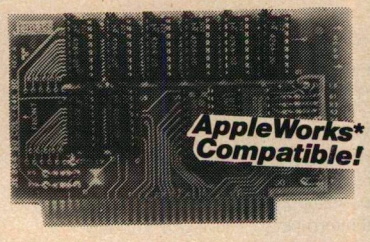
## Extended 80-Column Card for Apple *IIe**




The **JE864** is an extended 80-column/64K RAM Card. This effectively doubles the amount of data that your Apple *IIe* can display as well as its memory capacity. • Ideal for word processing • Ultra High Resolution Graphics capability • Complete with instructions

**JE864. . . *SALE!* . . $59.95**

## 16K RAM Card** (Language Card)

The **JE860 RAM Card** allows the Apple II and II+ computers to expand from 48K to 64K. Complete with instructions.

**JE860**. . . . . $39.95**

BIG BOARD

## 1MByte RAM Card
for Apple II, II+ and *IIe**

**BIG BOARD** comes complete with RAMDISK software for DOS 3.3, ProDOS, Pascal 1.2, and CP/M for Microsoft's Softcard. A separate driver is available for the AppliCard (StarCard-$39.95). You can choose the active addressing mode both via a jumper on the BIG BOARD or through software commands.

**BIG BOARD-1M** 1Meg RAM. . . . . **$299.95**
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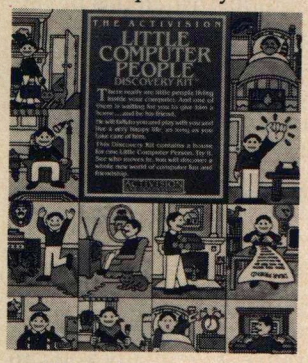
that every computer has a little person living inside of it. You won't get to see him, however, unless you provide him a comfortable home—the one on the LCP Discovery Disk has almost everything a Little Computer Person could want. Although every LCP is unique, they are all




intelligent and given to watching television, listening to records, playing the piano, using their own computers, typing letters (to you), and talking on the telephone (to whom and about what, no one knows yet). Left to their own devices, they can repeatedly engage in the above activities to amuse themselves. But their greatest hope in the whole world, the thing that was compelling enough to lure them out of their invisible existence within your computer, is having you for a friend.

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So now that I've seen for myself, I'm a believer. Everyone who owns a computer should get to know the LCP who resides within it. If I may be permitted a bit of speculation, though, I think that the LCP Discovery Kit will be most welcome in homes with children. Little Human People are sure to be amazed and delighted with their newfound computer friends and will undoubtedly spend hours at a time watching their LCP perform the repetitious actions that Big Human People could conceivably get bored with.

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*Donald Oliver*

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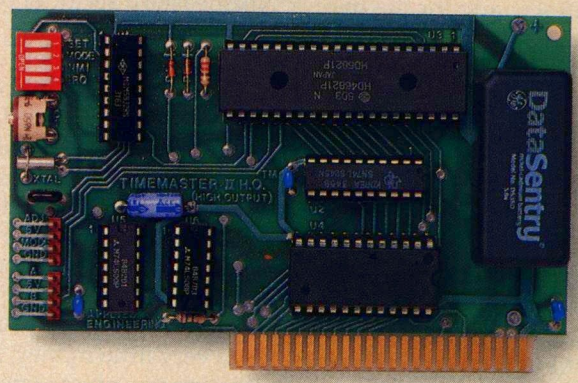


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## LEAVE THE DRIVING TO US

Autoduel, a strategy/role-playing game, is the latest in a dismayingly long series of games that predict a grim scenario for the future. As has become de rigueur for this sort of premise, Autoduel centers on the presence of a singular force of evil that needs to be vanquished, thus creating the need for a hero (or heroine) to do the vanquishing. Here, the hero is called a "driver," for Autoduel is based on Car Wars, a popular board game, and most of its action takes place on the freeways of the future, in the year 2030.

Actually, *freeways* is a misnomer—the roads are anything but free. They are populated by countless outlaws, all of whom reputedly report to a single leader, cryptically named Mr. Big. You uncover how he relates to the game, and to you, as you play. Suffice it to say that driving between the cities of the Northeastern sector of the United States isn't safe, because of these renegades, and you will have to be properly equipped and highly skilled in order to survive. It isn't for nothing that you are warned to "drive offensively—the life you save may be your own."

In the beginning, you have very little money, a situation you must remedy posthaste, for you have to have money—and lots of it—in order to build a car. And we're not talking K-car or even BMW here. No, you need a sturdy, roomy, well-fortified, well-everythinged vehicle

to withstand the rigors of the roads. Then you have to buy weapons, and you have a whole arsenal to choose from, including lasers, machine-guns, flamethrowers, spike droppers, and smoke-screens. In all, you can own up to ten cars. If you try to build more, the IRS catches up with you. Just like the real world, eh?

But first, there's that money problem, and you have several ways to get money quickly. You can take a bus to Atlantic City and gamble, or you can opt for a more practical solution: becoming an accomplished autoduellist, pitting your car against others in any one of the autoduellist arenas in various cities.

Until you get really comfortable with Autoduel, you can keep going from arena to arena, competing in events ranging from Amateur Night (the only division you may enter at first) to City Championships—the higher the division, the larger the purse. Eventually you can become a well-paid courier, delivering assorted goods from one city to another. These courier missions are assignments


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from the American Autoduellist Association (AADA), which has offices in several cities. Successfully completing these missions earns you prestige points. As your prestige increases, you are offered special missions, which you find out about through a series of clues. You would be wise to accept these missions, because they lead to a task of major import—the true goal of Autoduel—which is assigned to you by no less than the FBI.

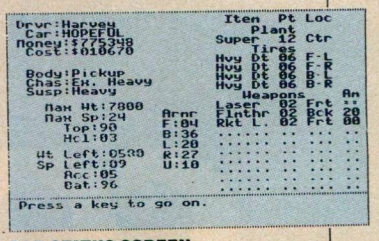
I know all this sounds exciting; I was also intrigued by the premise. But playing this game revealed many drawbacks. One of them is visual: As you go from city to city, the terrain is maddeningly similar. Trees, houses, graveyards, and even cattle (standing like statues, of course) dot the landscape, but every road looks like all the others. And even though only one route connects city to city, you can take numerous wrong turns and drive in circles for hours, until your car's battery runs down. Need I tell you that I took every possible wrong turn? I'm convinced I drove on roads that the game's authors don't know are on their disk.

Speaking of authors, Autoduel boasts an illustrious duo of designers, Lord British and Chuckles. Both of these men have been involved with many popular games in the past and have a long history of individual success. So I was sadly disappointed by the mechanics of the game-play, especially the substandard, almost primitive, Save Game routine. In Autoduel you can get killed quickly and often. Saving the game stops it cold in its tracks, and you have to reboot to continue. Restoring the game after getting killed is a lengthy, involved process, and you can't just pick up where you left off—you have to go back several steps. (Role-playing games, like their similar cousins, adventure games, must encourage experimentation; only through trial and error do you learn how to proceed correctly.)

And last but certainly not least, I found Autoduel extraordinarily hard to get started in, which is particularly disappointing, considering how well Lord British succeeded in making Ultima IV's beginning so magical and welcoming.

On the other hand, Autoduel's packaging is fun. You get an *Autoduel Manual & New Driver's Guide*, a Player Reference Card, a full-color road map, and a cute miniature tool kit. You don't want to get stranded in the Northeastern sector, that's for sure.

*Donald Oliver*

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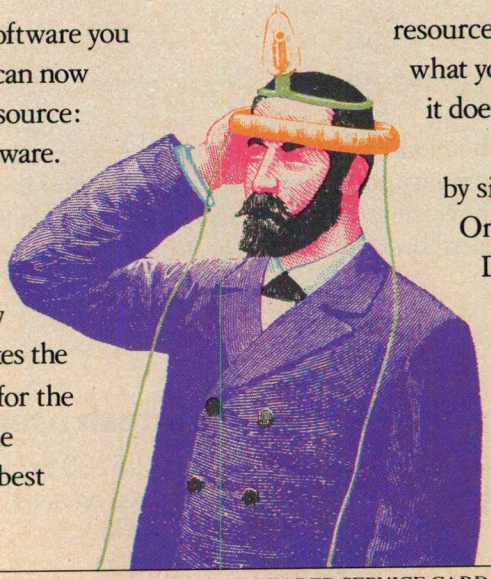

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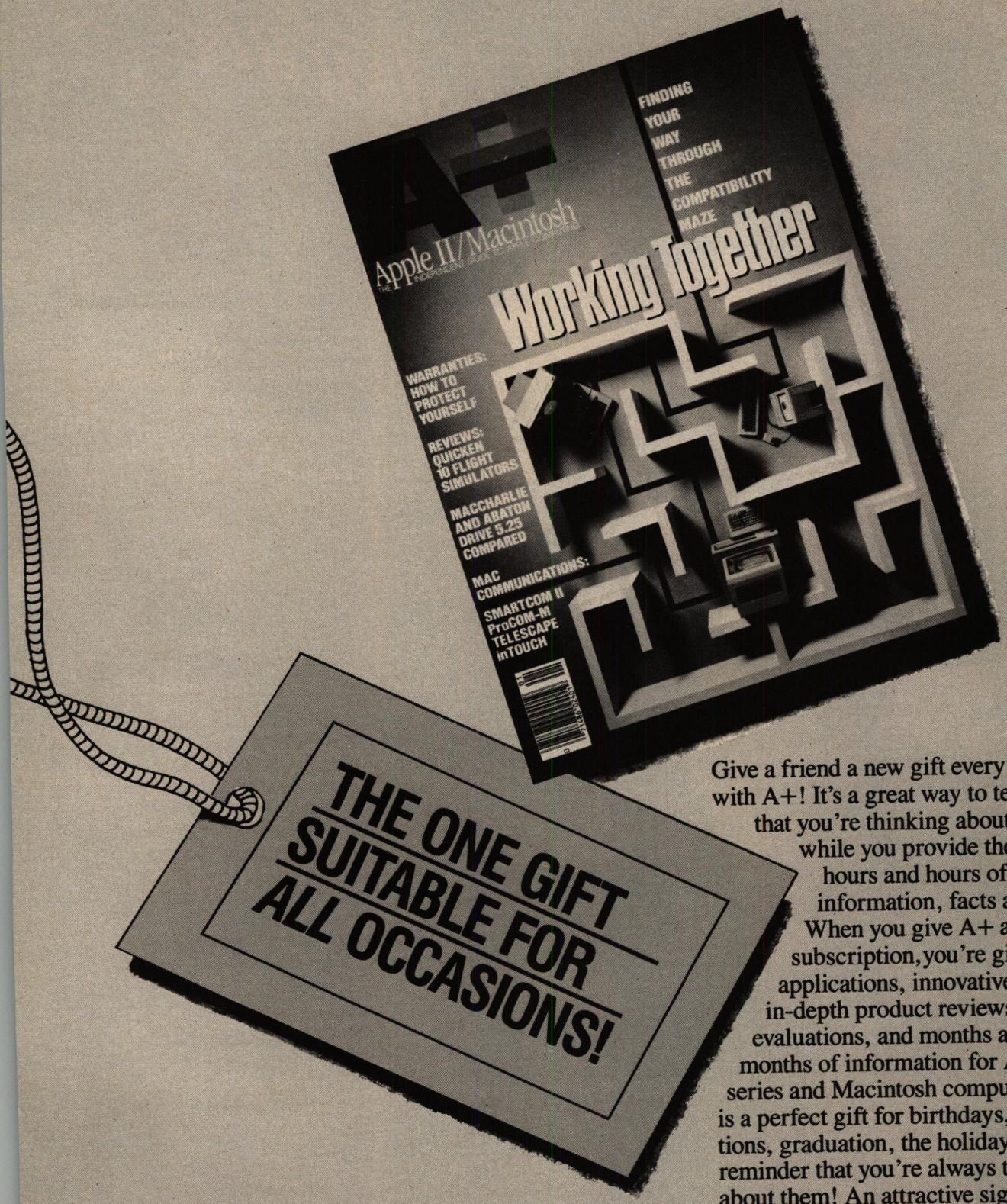


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BY MICHAEL WIESENBERG

# PREDICTING ODOMETER PALINDROMES

*Looking for numbers that read the same in both directions*

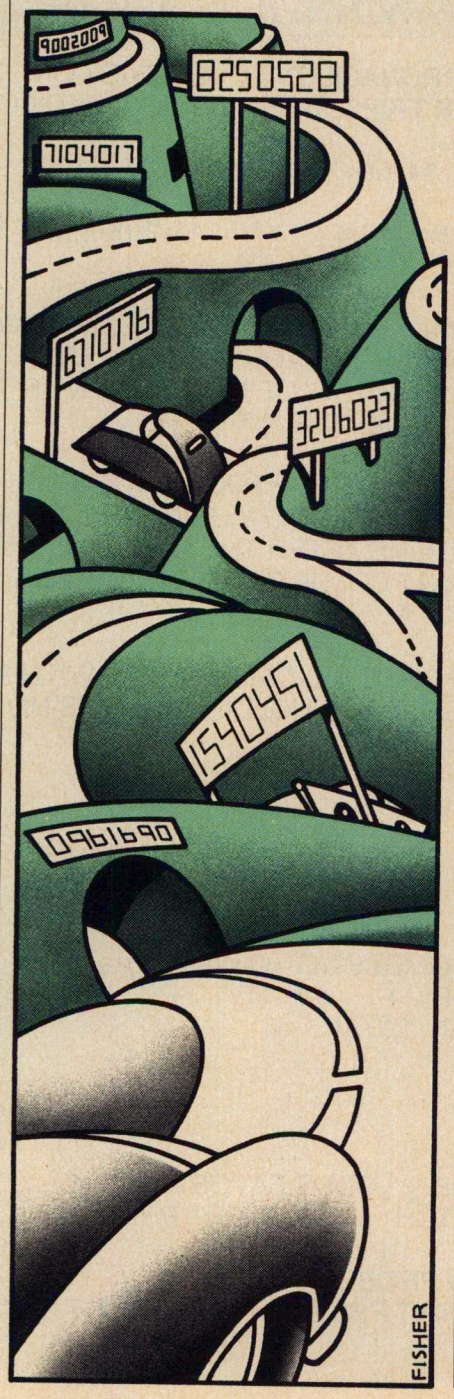
Your car's odometer can be a good source of numerical puzzles. From time to time for example, the six digits form a palindrome—that is, they read the same from right to left as left to right—which can be expressed algebraically as *xyzzy.x* (with *x*, *y*, and *z* possibly but not necessarily being all different integers). How many such occurrences are there in one complete cycle through the odometer? And what is the shortest trip (from where to where on the odometer, in miles) to contain 12 such numbers?

Send a complete program that solves both of these problems. If you send a diskette, please also include hard copy. Your program must be short, elegant, and self-documenting. The best solution wins a one-year subscription (or extension) to *A+* and a Certificate of Excellence in Programming and will be published here.

Please send all entries, which must be received by November 7, 1986, to Computer Calisthenics, Box 2329, Stanford, CA 94305. All entries become the property of the author. The winner will be selected by the author, whose decision will be final. The winning program will be announced in a future issue of *A+*.

**Answer to May's Puzzle**

Last May's puzzle asked which side had the best of it with two gamblers turning one card at a time each from a full deck—the one who bet that at least one card would match or the one who bet that there would be no matches?




I received a flood of entries that fell into three categories of approximately the same size: those that calculated the precise answer, those that provided an approximation with a Monte Carlo-type simulation, and those that for one reason or another were wrong.

Interestingly, of those who did not come up with the correct solution, most came close, and all of those would have bet on the "right" side of the proposition. The explanation is that many in this group used an incorrect algorithm that approached the correct answer for 52 cards (or for *all* of any sufficiently large deck). Had I specified flipping just half of a 52-card deck, however, they would have lost their money by betting on the wrong side of the proposition.

The incorrect algorithm that many submitted states that the probability of having at least one match in a deck of $n$ cards is $1-\frac{(n-1)}{n}^{n}$. For 52 cards, that works out to

$$1-\left(\frac{(52-1)}{52}\right)^{52}\approx.6357$$

The correct solution to this problem was expressed nicely in mathematical terms by Robert Stong, a member of the Department of Mathematics at the University of Virginia, Charlottesville:

"The probability of no matches is

$$\sum_{i=0}^{52}\frac{(-1)^i}{i!}=$$

$$1-\frac{1}{1!}+\frac{1}{2!}-\frac{1}{3!}+\ldots+\frac{(-1)^{52}}{52!}$$

which is approximately

$$\frac{1}{e}=\frac{1}{2.7182818284590452356\ldots}$$

**ILLUSTRATION BY** MARK FISHER

and the error is at most

$$\frac{1}{53!} \approx \frac{1}{4} \times 10^{-69}$$

"Thus the error is at most the 70th decimal place.

"The probability of having *exactly* one match is also $\frac{1}{e}$.

"Details can be found in A.W. Goodman and J.S. Ratti, *Finite Mathematics with Applications*, MacMillan Publishing Company (The Kaos problem, Chapter 5).

"It does not require a computer to do this problem—in fact, I just didn't use one."

I like his ingenuity, but he does not show any easy way to work out the solution—which I really think requires a computer—nor does he really explain where the answer comes from. And, although Stong says that the answer is approximate, actually the chance of there being at least one match converges on $1-\frac{1}{e}$. Almost all of the correctly done programs showed that, beyond six cards and for any size deck, the chance of a match is about the same, namely about .63212.

I received many excellent entries. I chose Richard Driscoll of Chicago as the May winner, because his Applesoft BASIC program, although not the fastest-running, includes the simplest explanation of what is going on here. His entry gives a precise answer to the problem. I checked several of the Monte Carlo simulations against it, and they came up with answers that were close when I ran them many times. The *exact* solution was what I was really looking for, however, and, in this situation, this program had the added advantage of running considerably faster than any simulation.

You can easily modify this program to provide the solution for any deck size by changing line 320 to read `320 INPUT "DECK SIZE ";N` ✚

## MAY'S WINNER: Richard Driscoll

```
100  REM  LET  P(K,M)  = PROBABILITY OF AT LEAST ONE MATCH IN THE
110  REM             FIRST K TRIES, WHEN USING A DECK OF SIZE M.
120  REM  THEN
130  REM     (A)  P(1,M) = 1/M, M = 1,..,52
140  REM  AND
150  REM     (B)  P(K,M) = P(K-1,M) + 1/M - (1/M)*P(K-1,M-1) FOR
160  REM                   K > 1 AND  M = K,..,52,
170  REM
180  REM  SINCE   P(K-1,M) = PROB. OF MATCH BEFORE THE K-TH TRY;
190  REM           1/M = PROB. OF MATCH ON K-TH TRY;
200  REM   (1/M)*P(K-1,M-1) = PROB. OF MATCH ON K-TH TRY AND A MATCH
210  REM                    BEFORE THE K-TH TRY.
220  REM
230  REM  IF WE PUT THE VALUES OF P(K,M) INTO A 2-DIMENSIONAL ARRAY
240  REM  WE CAN FILL THE FIRST ROW USING (A).  THE REMAINING ROWS
250  REM  CAN BE FILLED ONE AFTER THE OTHER USING (B) WITH K FIXED
260  REM  AND M RUNNING FROM K TO 52.  WE NEEDN'T BOTHER WITH
270  REM  VALUES FOR K > M.
280  REM
290  REM  WITH A LITTLE CARE WE CAN MANAGE WITH A 1-DIMENSIONAL ARRAY
300  REM  BY REUSING STORAGE HOLDING VALUES NO LONGER NEEDED.  WE
305  REM  CHOOSE TO DO THIS.
310  REM
320  N = 52: REM   MAXIMUM DECK SIZE.
330  DIM P(N)
340  FOR M = 1 TO N:P(M) = 1 / M: NEXT M
350  REM
360  FOR K = 2 TO N
365  PRINT K;" ";: REM   SOMETHING TO WATCH
370  FOR M = N TO K STEP  - 1
380  P(M) = P(M) + (1 - P(M - 1)) / M
390  NEXT M
400  NEXT K
410  REM
415  PRINT : PRINT
420  PRINT "DECK    PROB      ODDS FAVORING"
425  PRINT "SIZE   OF MATCH       A MATCH": PRINT
430  FOR K = 2 TO N
440  PROB = P(K):ODDS = PROB / (1 - PROB)
450  PRINT K;: HTAB 7: PRINT PROB;: HTAB 20: PRINT ODDS;" TO 1"
460  NEXT K
```

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# *Washington's* BELTWAY AND THEIR HIRED

## *The Macintosh is becoming the weapon of*

With his strong chin and sweep of light brown hair, Ken Breedlove looks like a fleshier version of the actor Donald Sutherland. He is doing little to allay that impression now as he sits comfortably in an office in Vienna, Virginia, hardly more than ten miles from the Capitol and the dozens of government agencies that spend a trillion dollars a year.

Like his acting lookalike, Breedlove has seemingly innocent eyes that can deceive. In truth he is a hired gun, earning his keep in a cruelly competitive business by helping firms plunder the gold vault of consulting and construction contracts that the government opens up every day.

His clients are the notoriously predatory firms that line the Beltway road surrounding the capital—thus their alias Beltway Bandits. They are the folks who produce the $10 screws and the $10 million screwups that your and my tax dollars pay for. The providers of goods and services to government agencies that Breedlove deals with include computer-system companies, system integrators, software developers, weapon manufacturers, and producers of military training systems.

Like most hired guns, Breedlove gives only vague answers when you ask him specifically whom he's ridden with. Visitors must agree not to mention the names of his clients.

***Ken Breedlove (left) and Jay Condren (opposite page) pose with their "weapon of choice," the Macintosh.***

When he does speak, however, Breedlove leaves no doubt that he is a new type of hired gun, one who's building a name inside the Beltway because of his special weapon, the Macintosh. He travels with two souped-up Macs, the nucleus of a portable desktop-publishing/destop-communication system.

Breedlove and Associates, which Breedlove directs, organizes and ties together a corporation's proposal team during the brief, intense time it is preparing a contract proposal. Ringmaster Electronics, a company run by Breedlove's friends Jay Condren and Mark Walter, helps produce that proposal, churning out graphics for the proposal on a Macintosh.

**On Target**

The two firms have a lot to confirm their prowess (Breedlove claims an 80% win rate). On its first three proposals after hiring Breedlove and his Macs, a client of Breedlove and Condren's won a contract worth $15 million, a contract worth $2 million, and another worth $10 million, with a good chance of more money to follow. Ringmaster went on last year to help this client win two out of the two other contracts it sought through Mac-enhanced proposals. As a result of these proposals' success, the client company invested in about $100,000 worth of Macs, LaserWriters, and Linotronic typesetting machines.

Breedlove and Ringmaster have launched what bandits and government purchasing agents say is a graphics revolution in contract pro-

**PHOTOGRAPHY BY** ROBERT SEVERI

# BANDITS GUNS

## *choice in the fight for government contracts.*

posals. What they are discovering has influenced who is getting the millions of dollars in contracts Washington gives away and can also easily apply to the way any Mac user should operate when thinking of putting graphics into a report. This is their lesson: Do your homework and then make sure the graphics show the results of that labor.

"The really uninitiated in this business will try to make a lot of claims for their products and use a lot of adjectives, with no support for their claims," says Breedlove, who has been a consultant for 13 years, following stints in federal and county government.

"Now the government has gotten very sophisticated in reading responses to these RFPs," he continues, using the abbreviation for Request For Proposal—Uncle Sam's announcement that he wants some work done. "They've got big checklists to find out if the proposal has answered each and every request in the RFP. The scoring generally goes from zero to nine points. These are then added up—they have a process to weight the scores and then come up with a final average.

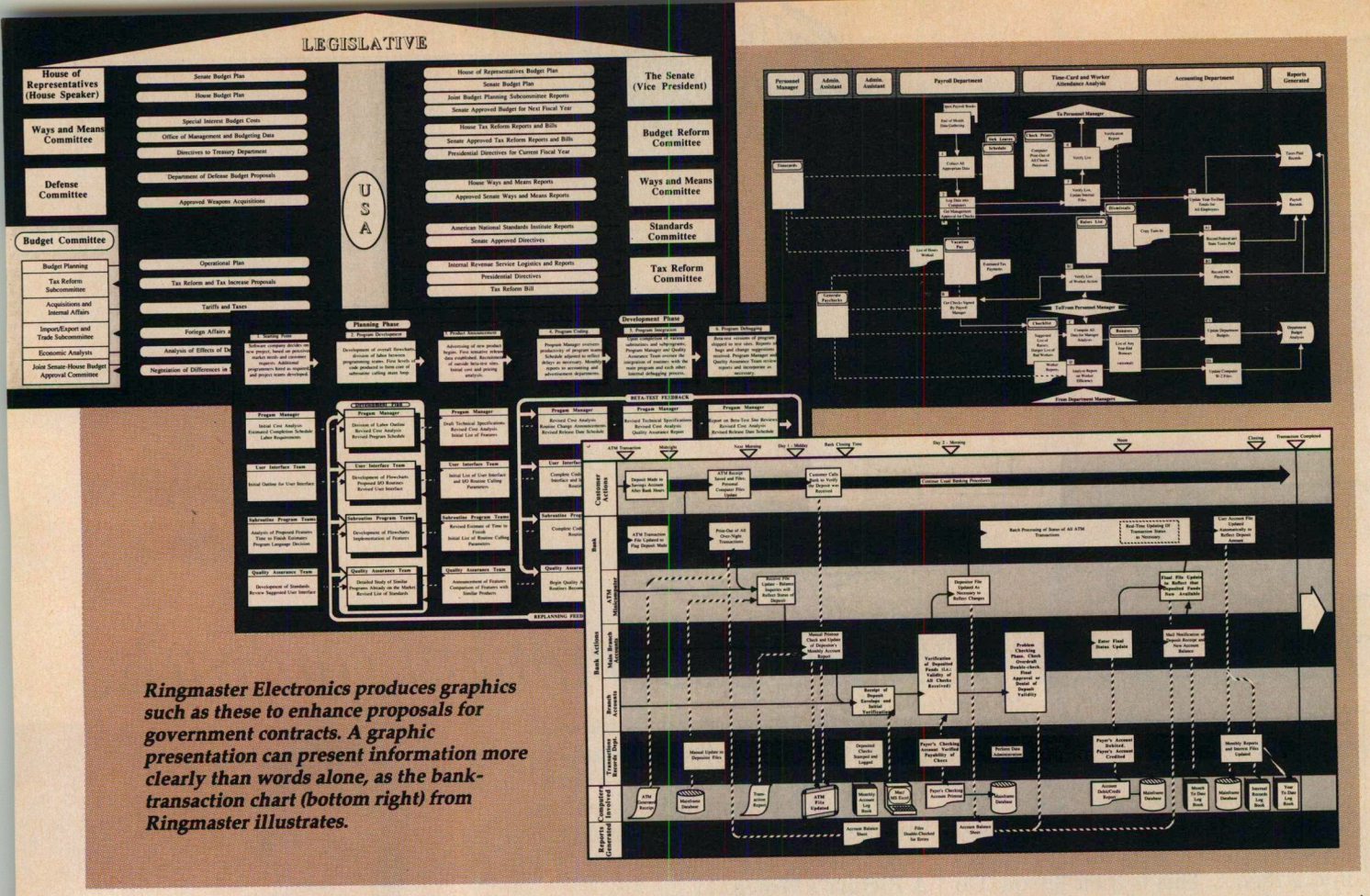
"Given that in many cases you're working with a page limit for the proposal and an evaluator who has a finite amount of time to read it, you must communicate your thoughts as effectively as possible," he says. "If you give them 400 pages, yes they'll read it, but then they've got six others to read and might forget yours. So because of the time constraints, the evaluator has to find the information, and the proposal has to speak clearly. Within that environment, graphics become important as a communications vehicle."

**A Picture's Worth . . .**

Breedlove figures he generally can get twice as much information into a page of graphics as he can into a page of text. That advantage is growing more important, he explains, with the arrival of government restrictions that severely limit the number of total pages a Bandit can submit. Even proposals for projects as big as a $100 million computer system might permit no more than 150 pages for the technical stuff and 100 pages for how the system will be managed.

Proposal writers don't have much time to ready their pitches, either. The average proposal takes up to two months of 12-hour days, 7 days a week, to prepare. A 50-page proposal can easily cost a firm $30,000. The rewards can be huge, however. The Pentagon alone is spending $29.6 billion this year for contracts in research, development, testing, and evaluation.

The government sounds the call for so many proposals, in fact, that the summaries alone fill a 48- to 64-page newsletter every day. In one recent newsletter issue, the contracted work the government was seeking included an assessment through war games of NATO's Southern Flank in case of a communist attack, a proposal to create antiarson programs, a




***Ringmaster Electronics produces graphics such as these to enhance proposals for government contracts. A graphic presentation can present information more clearly than words alone, as the bank-transaction chart (bottom right) from Ringmaster illustrates.***

study of how microwaves survive in space, and a request for plans to improve the health of Indonesians in West Sumatra. With so much money at stake, firms are quite willing to line up hired guns such as Breedlove and Condren to get the gold.

For their first project, Ringmaster co-owners Condren and Walter prepared some 170 drawings, under Breedlove's direction, for a so-called Research and Development project—the government says it wants a task done and leaves to the contractor the task of describing what it will do and how the firm will assess the results.

Such projects require intense adherence to the Mac Bandits' First Rule: Learn when—and when not—to use graphics instead of text.

"In our proposals we explain *what* and *how* with graphics (see examples above) and then use the narrative to explain the *why* and to highlight various parts of the graphics," Breedlove explains. "We try to stay away from making the graphics themselves the focus."

He points to a chart that tracks bank transactions (in example above, which is reworded for camouflage). With its eight levels and multitude of arrows, it helps readers follow the possible routes of money in a bank more easily than if a writer tried to explain it with words alone.

**Beware of the Candy Effect**

Although graphics can help, Breedlove and Condren say, Mac users must avoid getting overwhelmed by what they call the "candy effect," the desire to incorporate graphs simply for the sake of having them.

Frank Mallalieu agrees. As assistant chief for design and construction contracts in the General Services Administration, he will help oversee the granting of more than $300 million worth of contracts to construction firms this year. Each of the hundreds of projects his office handles can attract up to 50 proposals, he says, and more and more of those proposals are showing up with more art than a high-school yearbook.

"Good graphics can be a definite plus, but they can be overdone," he comments. "We get some very flashy graphics that are like a rich dessert. Contractors think the stuff is going to win the day for them, but it isn't true."

Jeff Davis, who handles technical services for Falcon Microservices, Inc., of Bethesda, Maryland, says companies are still winning contracts this year simply because they put in graphics but that the novelty is wearing off. What matters more and more, he believes, is the quality of the graphics—which leads to the Bandits' Second Rule: Use your graphics to help you seek the truth.

Breedlove says one hidden quality of artwork in a proposal is that it "helps drive out the b.s."

"With text you can be wishy-washy," he continues. "Writers tend to do that because they have not worked out a complete statement. If a chart shows a flaw, however, there's no way you can reach for the truth."

Condren says he has noticed that writers who create a graphic tend to be more likely to make minor corrections on it than they are with text. "The errors just jump out so clearly that it is harder for dumb mistakes to get through."

Such changes often take place in the "war room" that Breedlove sets up at every Bandit's office where he takes charge of a contract proposal. As soon as Ringmaster finishes each chart, Breedlove puts a copy of it up in the room for all to see. Having those charts around gives everyone a clear picture of where the project stands and what it involves.

Breedlove and Condren tend to pack a lot of information into their graphics, but they both stress the

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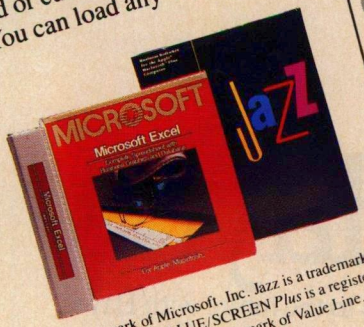


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need to keep the point of each chart simple. Graphs should be organized thematically, and groups of graphs should be packaged together when they show related concepts, according to Breedlove.

Presentations should also include a photograph of any product being proposed, as soon as possible after it is first mentioned. If anything, the photo "causes the reader to think, 'Well, at least they got one of them built, since they were able to take a picture of it,' " Breedlove says.

**Beyond Boilerplate**

Condren heaps particular abuse on a chart that tries to show a "bridge to greater productivity" in which individual concepts make up the building blocks of the bridge. Future contract reviewers, he explains, are likely to be unimpressed by pictorial metaphors when other proposals will be reserving their graphics for facts.

Breedlove and Condren complain that firms too often resort to "boilerplate"—copy that was prepared for a similar project—and are beginning to do the same with graphics, even though the point of each proposal varies, which leads us to the Bandits' Third Rule: Make your graphics an integral part of each proposal, not just boilerplate you are throwing in to make the package look pretty. In the old days, when each chart or drawing took weeks to produce, it might have made sense to recycle graphics, Breedlove says, but the Macintosh works so quickly that a Bandit should be able to create new charts from scratch, eliminating the need for what he calls the "beautiful garbage" of past proposals.

Breedlove says the boilerplate mentality also reflects the old view that you should produce the entire text of a proposal and only then decide what graphics are necessary. With the Mac, he concludes, creating the graphics first is preferable. They are more likely than the words to give you a clear idea of the impression you want to make.

So picture this: A couple of hired guns are sitting in an office not far from the capital. A few feet away are two Macs and a pile of juicy contract proposals ready for the taking. Consider the possibilities. ✚

---

*Craig Webb is an editor on the Foreign Desk at United Press International who has written frequently on the Mac's growing role in desktop publishing.*


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| #M1B | Macintosh, Keyboard, and Mouse | $19.95 |
| #M1 | Macintosh, Keyboard, Imagewriter[1], and Mouse | $27.95 |
| #M2 | Macintosh, Keyboard, Imagewriter[1], External Drive (400/800K), and Mouse | $29.95 |
| #M5 | Macintosh, Keyboard, Large Imagewriter, and Mouse | $29.95 |

**Apple IIc Sets**

| | | |
|---|---|---|
| #C1 | Apple IIc CPU, Monitor[2], and Mouse *(Separate covers)* | $18.95 |
| #C2 | Apple IIc CPU, Monitor[2], External Disk Drive, and Mouse | $24.95 |
| #C3 | Apple IIc CPU, Monitor[2], Imagewriter[1], External Disk Drive, and Mouse | $29.95 |
| #C4 | Apple IIc CPU, Monitor[2], Scribe, External Disk Drive, and Mouse | $29.95 |

**Apple IIe Sets**

| | | |
|---|---|---|
| #E1 | Monitor[3] atop IIe CPU *(One piece cover. Components available)* | $23.95 |
| #E11 | E1 with Imagewriter[1] *(Two covers)* | $31.95 |
| #E2 | Monitor[3] atop Profile DuoDisk atop IIe CPU, *(One piece cover. Components available)* | $26.95 |
| #E21 | E2 with Imagewriter[1] *(Two covers)* | $34.95 |

[1] - Substitute **Imagewriter II** for Imagewriter. Any set add $1.00.
Substitute **Laserwriter** for Imagewriter. Any set add $5.00.
[2] - Substitute IIc **Color Monitor** for Green Monitor. Any IIc set add $1.00.
[3] - Substitute IIe **Color Monitor** for Monitor II. Any IIe set add $1.00.

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**STAND-UPS:** Universal printer stands designed to raise your printer for easy viewing and provide ample space below for paper storage. Our **STAND-UPS** are metal with a textured powder coat finish (same as your printer), and include molded rubber booties to protect your printer and desk top. Available in black or computer white. **STAND-UPS** are truly the first reasonably priced printer stands. Retail Value $23.95 ..... *Direct Order* $18.95

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Now, just by taking (or sending) your Mac files into service bureaus such as those in the chart that accompanies this article, you can enter the new world of inexpensive Mac LaserWriting and typesetting. These firms offer fast turnaround, control of the final product, the ability to preview documents on your Mac screen,

| SERVICE BUREAU | BASIC SERVICES OFFERED | | | |
|---|---|---|---|---|
| | LASERWRITER / TYPESETTING | PRICE | "FONTS" AVAILABLE | QUANTITY DISCOUNTS |
| **ALPHABET SOUP**<br>*San Francisco, CA* | LaserWriter | $1/page | Stnd & Adobe | 200+: ask |
| | Linotronic 100 | $9.75/page | Plus & Adobe | 100+: ask |
| **ALPHAGRAPHICS**<br>*Redwood City, CA* | LaserWriter | $2/page; $12/hour | Stnd; PWA | 5+: $1.50–$1.75 |
| **ALPHAGRAPHICS**<br>*Atlanta, GA* | LaserWriter | $2/page; $12/hour | Stnd | 6+: $1–$1.50/page |
| **APTOS POST TYPOGRAPHY**<br>*Aptos, CA* | Linotronic 100 | $9.95/page[1] | Plus & Adobe | 50+: $5.97–$7.46 |
| **CARBON ALTERNATIVE**<br>*San Francisco, CA* | LaserWriter | 30¢/page; $2/15 min. | Stnd | 20 hrs.=$100 |
| **CBM TYPE**<br>*Sunnyvale, CA* | Linotronic 100 | $9.75–$15/page | Stnd | On project basis |
| **DESKTOP PUBLISHING, INC.**<br>*San Rafael, CA* | LaserWriter | 50¢/page; $3/15 min. | Stnd & Plus | $10–$15/hour + 25¢/pag |
| | Linotronic 300 | $10–$15/page | Plus | 4+: $7.50[2] |
| **IMAGESET CORPORATION**<br>*San Francisco, CA* | Linotronic 100 | $10/page | 8 | On project basis |
| **INTERFACE**<br>*Fairfax, CA* | LaserWriter Plus | 25¢/page; $15/hour | Stnd & Plus | Will quote |
| **KINKO'S COPIES—CAPITOL HILL**<br>*Washington, DC* | LaserWriter Plus | $2/page | Plus | 2+: $.45–$1.25/page |
| **KRISHNA COPY CENTER**<br>*Berkeley, CA* | LaserWriter | 30¢/page; $6/hour | Plus | 99+: 20¢–25¢/page |
| | Linotronic 100 | $5/page | Plus & Adobe | 20+: $3.50–$4.50/page |
| **THE LASER EDGE**<br>*Oakland, CA* | LaserWriter | $6 first page; $12/hour | Stnd & Plus | 2+: $1/page |
| **LASER PRINTING SERVICES**<br>*Southfield, MI* | LaserWriter | $1/page | Stnd; PWA | 100+: 50¢/page |
| | Linotronic 100 | $6/page | Stnd; PWA | 100+: $4/page |
| **LASERWRITE CORPORATION**<br>*Palo Alto, CA* | LaserWriter Plus | 50¢/page; $2.50/15 min. | Plus & Adobe | 100+: 10% off |
| | Linotronic 100 | $10/page | Plus & Adobe | On project basis |
| **PC RESOURCES**<br>*Norwell, MA* | LaserWriter | 50¢/page | Plus | |
| **SPECTRUM ARTS LTD.**<br>*Baltimore, MD* | LaserWriter | $1.50/page | Plus & Adobe | As low as 50¢/page |
| | Linotronic 100 | $8/page | Stnd & Adobe | As low as $5/page |
| **TECH ART**<br>*San Francisco, CA* | LaserWriter | 50¢/page; $15/hour | Plus | |
| **21st CENTURY GRAPHICS**<br>*Portland, OR* | LaserWriter Plus | $35/hour | Plus | On project basis |

flexibility for changes—and, at $10 or under per page, relatively low cost. The traditional typesetting industry will never be the same again.

**The Chart**

The chart that accompanies this article (below) will acquaint you with the available services and assist you in choosing one. It includes the following information:

■ **Basic Services Offered**

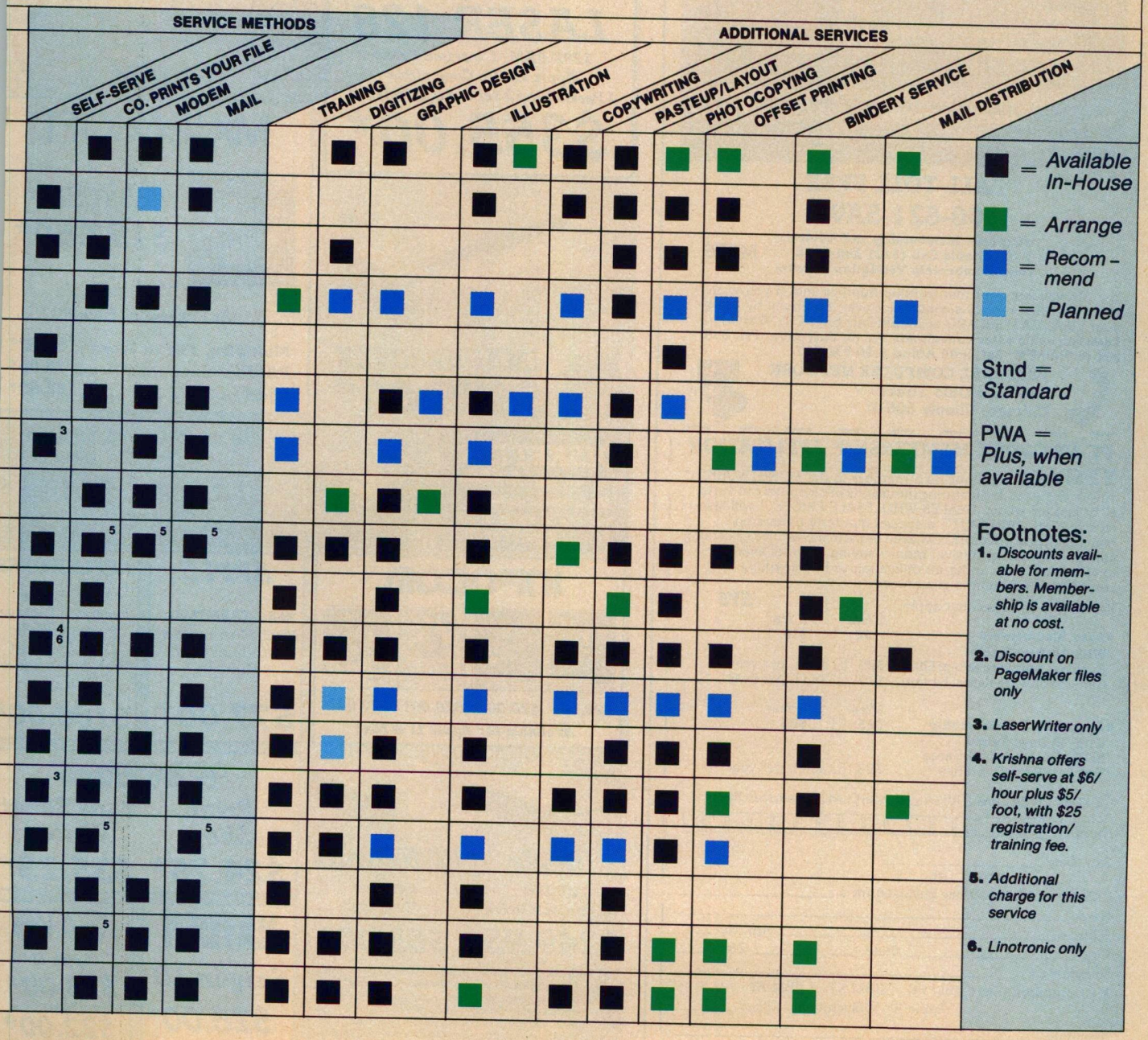
For each service bureau, I have indicated whether the company offers LaserWriter output (at a resolution of 300 dots per inch) and/or Linotype Company Linotronic typesetting output (at 1270 or 2540 dots per inch). The designations L100 and L300 indicate the Linotype models that are offered, with L300 having the higher resolution.

■ **Price**

The price indicated is for output of a prepared Macintosh document—you take or send in a document, and you receive output. Because printing times vary with document complexity, many service bureaus price their services as a sum of time (hourly) and per-page charges. In some cases, pages larger than 8½ × 11 inches have a higher charge. Any quantity discounts are noted in the so-named row.

■ **"Fonts" Available**

When the LaserWriter first arrived, it contained only the Helvetica and the Times fonts, plus a Courier font (which looks like typewriter type) and a Symbol font. Shops that have only this "Standard Font Set" are so noted with the abbreviation *Stnd*. Now that the LaserWriter Plus has arrived, so have eight more fonts; if a service bureau offers these fonts, the word *Plus* appears under Fonts Available. *Stnd; PWA* means *Standard; Plus When Available*, which indicates the



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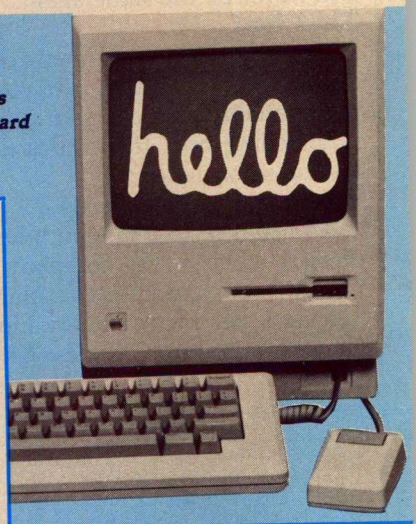

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**128K RAM, 1 Internal Drive, Apple IIe/IIc Compatible 1 Parallel and 2 Serial Ports Included**

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| Chart ..... | 62.50* |

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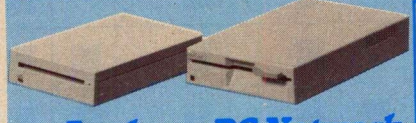

**Apple 800KB Macintosh Drive $349.95***

**PC Network External IIc Drive $85.00***

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**Print Shop $24.75*** **Bank Street Writer $35.25***

## HAYDEN

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**Apple II $18.00*** **Mac $22.00***

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|---|---|
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| **Broderbund** *Bank Street Writer* | 35.25* |
| **Broderbund** *Lode Runner, Choplifter* | 17.25* |
| **Broderbund** *Print Shop* | 24.75* |
| **Davidson & Associates** *Speed Reader II* | 31.00* |
| **Davidson & Associates** *Math Blaster* | 22.00* |
| **Davidson & Associates** *Word Attack!* | 21.50* |
| **Epyx** *Winter Games, Temple of Apshai Triology or Summer Games II* | ea. 20.00* |
| **Hayden** *Sargon III* | 24.75* |
| **Infocom** *Deadline, Suspended, SeaStalker* | 24.00* |
| **Infocom** *Enchanter, Planet Fall, CutThroats* | 20.00* |
| **Infocom** *Zork II, Zork III* | 22.00* |
| **Infocom** *Zork I, Witness, Hitchhiker's Guide,* | 20.00* |
| **Infocom** *Suspect,Infidel,Sorcery* | 22.00* |
| **Microprose** *F-15 Strike Eagle* | 18.50* |
| **Microprose** *Silent Service* | 18.50* |
| **Microsoft** *Flight Simulator for the Mac* | 27.00* |
| ▶**Mindscape** *The Mist, First Blood Part 2, or A View to a Kill* | ea. 21.00* |
| **Pinpoint Publishing** *Micro Cookbook* | 21.00* |
| **Timeworks** *Evelyn Wood Dynamic Reader* | 36.00* |
| **Sierra On-Line** *Frogger—Mac Too!* | 19.50* |
| **Simon & Schuster** *Typing Tutor III—Mac Too!* | 28.25* |
| **Sir-Tech** *Wizardry* | 26.97* |
| **Spectrum Holobyte** *GATO* | 18.00* |
| ▶**Spinnaker** *Alphabet Zoo, Face Maker, Story Machine, Hey Diddle Diddle, Rhymes & Riddles* | 15.25* |
| ▶**Spinnaker** *Delta Drawing* | 20.75* |
| **Sublogic** *Flight Simulator II* | 27.25* |
| **Sublogic** *Night Mission Pinball* | 20.00* |

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|---|---|
| **Apple** *Apple Works* | $160.00* |
| **Apple** *MacTerminal* | 77.00* |
| **Arrays** *Home Accountant/Fin Planner* | 69.00* |
| **Arrays** *Home Accountant Expanded* | 42.00* |
| **Borland International** *Reflex for the Mac* | 59.00* |
| **Borland** *SideKick for Mac* | 37.50* |
| **Borland International** *Turbo Pascal* | 35.00* |
| **BPI** *GL, A/P, A/R, P/R, or INV Each Only* | 205.00* |
| **Broderbund** *Bank Street Writer* | 35.25* |
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| **Central Point** *Copy II Plus* | 16.25* |
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| **Hayes** *Smartcom II for the Mac* | 78.00* |
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| ▶**Living Videotext** *ThinkTank—512K Mac* | $85.00* |
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| **Microsoft** *Excel* | 197.50* |
| ▶**Microsoft** *Multiplan (DOS or CP/M)* | 97.50* |
| ▶**Microsoft** *For Macintosh: Word, File, Multiplan* | 97.50* |
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## HARDWARE

(Please add shipping and handling charges found in italics next to price.)

### COMPLETE SYSTEMS

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|---|---|---|
| **Apple** *Apple IIe, Apple IIc, Macintosh* | CALL | |
| **AT&T** *6300 PC CPU 2 128K/2 Floppy/1 Serial/1 Parallel* | $1,775.00* | (35.64) |
| ▶**Central Point** *Laser 128 Apple II+/Apple IIe Compatible* | 355.00* | (7.67) |
| ▶**Compaq** *DeskPro w/256K/1 Floppy/20MB Hard Disk* | 1,805.00* | (43.18) |
| **Compaq** *Hard Disk Portable 256K* | CALL | |
| ▶**IBM** *PC Base System with 256K 2DS/DD/FDC* | 1,910.00* | (22.14) |
| ▶**IBM** *PC Professional Hard Disk 256K/DS/DD/FDC/20MB Hard Disk* | 1,337.00* | (31.77) |
| **IBM** *PC/AT Base System 1.2MB Floppy/256K* | CALL | |
| **Toshiba** *T1100+Laptop Computer w/256K 2 Floppies/1 Ser/1Par/MS-DOS* | 1,341.00* | (26.82) |

### DISK DRIVES & CONTROLLERS

| | | |
|---|---|---|
| **Apple** *Macintosh Add On Drive* | $349.95* | (7.50) |
| **Apple** *UniDisk 3.5"w/accessorykit* | 319.00* | (6.89) |
| **Corvus** *6MB Hard Disk* | 675.00* | (14.58) |
| **Haba** *800KB DS/Mac Drive* | 349.95* | (4.64) |
| **IOmega** *5MB Macnoulli* | 620.00* | (27.00) |
| **IOmega** *Dual 10MB Bernoulli* | 1,700.00* | (46.44) |
| **Micro-Sci** *A2 143KB Drive* | 150.00* | (5.00) |
| **Micro-Sci** *Floppy Controller* | 65.00* | (2.50) |
| **Paradise** *10MB Hard Disk Subsystem for Macintosh* | 525.00* | (11.34) |
| **Paradise** *20MB Hard Disk Subsystem for Macintosh* | 745.00* | (16.09) |
| **PC Network** *Apple IIc External Drive* | 95.00* | (5.00) |
| ▶**PC Network** *Apple IIe Disk Drive* | 85.00* | (1.84) |
| **Tecmar** *10MB Hard Disk for Mac* | 799.00* | (17.26) |

### MODEMS

| | | |
|---|---|---|
| **Anchor** *Lightning 2400* | $309.00* | (2.50) |
| **Anchor** *Signalman Express* | 205.00* | (5.00) |
| **Hayes** *Micromodem IIe/Smartcom* | 125.00* | (2.50) |
| **Hayes** *Smartcom II for the Mac* | 78.00* | (1.50) |
| **Hayes** *Smartmodem 1200* | 340.00* | (5.00) |
| **Hayes** *Smartmodem 2400* | 525.00* | (5.00) |
| **Novation** *Apple Cat II* | 174.45* | (2.50) |
| **Prometheus** *ProModem 1200 with Mac Pac* | 247.00* | (6.00) |
| ▶**Prentice** *Pop Com w/MacPac 1200 Baud Modem, Cable, Straightalk* | 253.00* | (6.00) |
| **U.S. Robotics** *Courier 2400BPS* | 215.00* | (2.50) |
| **U.S. Robotics** *Password* | 345.00* | (5.00) |
| **Zoom** *Modem IIe* | 172.00* | (2.50) |
| **THE™MODEMS ARE 100% HAYES COMPATIBLE** | 95.00* | (2.05) |
| **THE™1200 COM External** | 129.00* | (5.00) |
| **THE™2400 COM External** | 277.00* | (5.00) |

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|---|---|---|
| **Amdek** *Video 300G Composite* | $110.00* | (3.00) |
| **Amdek** *Video 300A Composite* | 120.00* | (3.00) |
| **Amdek** *Color 600 RGB* | 365.00* | (3.00) |
| **Apple** *NEW! Super Color IIe* | 255.00* | (2.55) |
| **Apple** *Color Monitor IIc* | 259.00* | (2.55) |
| **Magnavox** *14" Color RGB 640x280* | 275.00* | (5.94) |
| **Princeton** *HX-9 9" RGB Monitor* | 365.00* | (3.00) |
| **Princeton** *HX-12 RGB Monitor* | 360.00* | (6.00) |
| **Taxan** *620-U High Res Color* | 382.00* | (3.00) |
| **Thompson** *14" RGB Monitor 560x240 w/cable* | 285.00* | (2.50) |
| **Zenith** *ZVM 1230A NEW! 12" High Res Green/Non Glare* | 91.00* | (2.50) |

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|---|---|---|
| **AST Research** *Multi I/O-2* | $155.00* | (2.50) |
| **Microtek** *Dumpling/GX* | 55.00* | (2.50) |
| **Orange Micro** *Grappler +* | 66.00* | (2.50) |
| **Orange Micro** *Serial Grappler* | 66.00* | (2.50) |
| **PC Network** *Z80 Card* | 35.00* | (2.50) |
| **Quadram** *Multicore 1 Parallel, 1 Serial, Clock, Expandable to 256K* | 140.00* | (2.50) |
| **Quadram** *MP-8K Microfazer Buffer (Expandable)* | 110.00* | (2.50) |
| **Quadram** *eRAM-80COL w/64K* | 88.00* | (2.50) |
| **Street Electronics** *ECHO II Speech Synthesizer* | 85.00* | (2.50) |
| **Titan Technologies** *Accelerator IIe* | 207.35* | (2.50) |

### PRINTERS

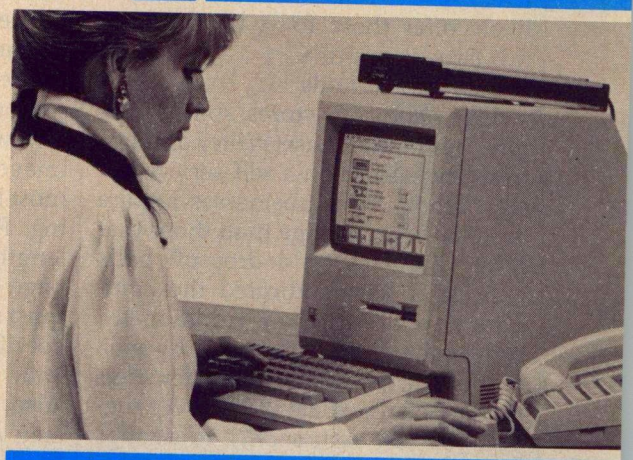
| | | |
|---|---|---|
| **Apple** *15" Imagewriter w/Mac kit* | $475.00* | (10.26) |
| **Apple** *Imagewriter II 80COL/200CPS NLQ Color* | 419.95* | (9.07) |
| **Apple** *LaserWriter* | 4,895.00* | (75.00) |
| ▶**Citizen** *MSP-10 160CPS/80COL* | 259.00* | (5.59) |
| ▶**Citizen** *MSP-15 160CPS/132COL* | 340.00* | (7.34) |
| ▶**Citizen** *120D 10" Par/4K Buf. w/Trac* | 169.00* | (3.65) |
| **Citizen** *Premiere 35 35 CPS Daisywheel 132COL/Fric + Trac* | 420.00* | (9.07) |
| **Epson** *LX-80 100CPS/80COL* | 225.00* | (4.86) |
| **Epson** *FX-85 160CPS/80COL* | 345.00* | (7.45) |
| **Epson** *FX-286 200CPS/132COL* | 440.00* | (9.50) |
| ▶**Epson** *LQ-1000 180CPS/60CPSNLQ* | CALL | |
| **Epson** *DX-35 Daisywheel Printer 35CPS/132COL/True Letter Quality* | 590.00* | (12.74) |
| **NEC** *2030 20CPS Letter Quality* | 605.00* | (13.00) |
| **NEC** *3530 33CPS Letter Quality* | 690.00* | (14.90) |
| ▶**Okidata** *ML-182 NEW! 120/CPS LQ Model/Fric* | 188.00* | (4.06) |
| ▶**Okidata** *Color 20 80CPS/100 LQ Model/Epson Graphics (Requires Interface)* | 129.00* | (2.35) |
| ▶**Okidata** *ML-192/AP Sleek Design 160 CPS LQ Model/Fric/IBM Graphics* | 315.00* | (7.34) |
| **Okidata** *ML-193P 132COL/160CPS* | 425.00* | (9.18) |
| **Panasonic** *KX-P1091 120/75/22CPS 10" Parallel w/Tractor* | 220.00* | (4.75) |
| **Panasonic** *KX-P1092 180CPS 12" Parallel w/Tractor* | 304.85* | (6.58) |
| **Toshiba** *P341 132COL/216CPS* | 699.00* | (15.10) |
| **Toshiba** *P351 132COL/288CPS* | 959.00* | (21.34) |

### ACCESSORIES

| | | |
|---|---|---|
| **Apple** *IIc Mouse w/mouse paint* | $69.00* | (1.49) |
| ▶**Assimilation Process** *MacTurbo* | 73.50* | (2.50) |
| ▶**3.5" Macintosh Diskettes w/Free Flip 'n' File** | | |
| *SS/DD (Box of 10)* | 12.50* | (1.00) |
| *DS/DD (Box of 10)* | 16.95* | (1.00) |
| **Curtis** *Diamond Surge Protector* | 23.50* | (1.50) |
| **Hayes** *Mach II Joystick for IIe* | 25.00* | (1.50) |
| **Hayes***Mach III Joystick w/Fire Button* | 26.50* | (1.50) |
| **Innovative Concepts** *Flip 'n' File 50* | 11.95* | (1.50) |
| **Kensington** *System Saver Fan* | 56.97* | (1.50) |
| **Curtis** *Ruby Surge Protector* | 39.00* | (1.50) |
| **PC Network** *Cooling Fan with Surge Protector & Dual Outlets* | 25.00* | (1.50) |
| **P.T.I** *585 Datashield Surge Protector* | 45.00* | (1.50) |
| **Thunderware** *Optical Digitizer No Costly Camera Equipment Needed!!* | 155.00* | (2.50) |
| **WP Printer Paper** *2600 Perfed Sheets* | 17.00* | (1.50) |

CIRCLE 315 ON READER SERVICE CARD

# PC NETWORK



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*In Illinois (312) 280-0002 Validation Code M5Y6*

*Customer Service and Order Status (312) 280-1567*

shop has ordered and is awaiting delivery of the Plus fonts. It will most likely offer these fonts by the time this issue is in print.

■ **Service Methods**

Like photocopy stores, some shops offer use of their LaserWriter or Linotronic typesetter on a self-service basis. Clearly, these businesses require more user knowledge than those that print your files on a drop-off basis only, so I have indicated the company's service method. Additionally, some companies accept files by mail or modem, increasing access for users not in the immediate vicinity. We suggest you call each service to arrange for mail and modem access.

■ **Additional Services**

Many of these service bureaus are expansions of other businesses. Therefore, these companies are often one-stop shops, offering photocopying and/or the services of graphic artists. In some cases, if you choose not to arrive with your document already designed, the service bureau will assist you in creating it. In some cases, the company can photocopy, offset-print, and even mail out copies of your documents. Each of these additional services has its own price, so please contact the companies for more information.

**Usage Hints**

The LaserWriter is a fairly accurate preview device for the Linotype typesetting machines, but you will notice a few minor differences between ImageWriter and LaserWriter output, most based on the change in font sizing. For instance, be aware that line lengths will change, meaning that page breaks can vary. If certain text must stay on a certain page, be sure to specify accordingly when you place your order for LaserWriter output. Also, if you want columns of text to stay aligned, space them over with tabs, not spaces.

Many service bureaus suggest, and sometimes require, that MacWrite users have Version 4.0 or higher and the LaserWriter fonts installed on their disk and that they use those LaserWriter fonts in their documents. Even if the service you choose doesn't have such a requirement, following this suggestion will allow you to preview your document with the correct fonts before you take your disks in. In any case, either you or the service bureau will have to make the conversion from the Macintosh screen fonts to the LaserWriter screen fonts before printing can occur. MacWrite upgrades are available from dealers, and the LaserWriter screen fonts are often available from the service bureaus themselves.

**Finding Other Service Bureaus**

At the rate these companies are springing up, surely many more exist by now than I have indicated here. If you want to find one in your locale, I suggest these research leads: local Macintosh users' group, the advertisements in the back of Macintosh and Apple magazines, the national headquarters of some of the chain service bureaus (the numbers are in the list of addresses), local computerized typesetting places, local Macintosh dealers, and local graphic-design houses that advertise computer compatibility. +

*Patricia Dines has a B.S. in computer science from Duke University and ten years' experience in both the technical and user arenas of the computer industry. Her current commitment is to assist users, through computer training and writing, in applying computers to support their own company and personal goals.*

When you find a toll-free number in an ad, make sure you use it! It means you will get faster service. When you call an advertiser's toll-free number, be sure to tell them "I saw your ad in A+ Magazine."

## MAC LASERWRITING AND TYPESETTING

# SERVICE BUREAUS

**Alphabet Soup**
2822 Van Ness Avenue
San Francisco, CA 94109
(415) 885-3156

**AlphaGraphics**
1048-F El Camino Real
Redwood City, CA 94063
(415) 368-3400
*For other AlphaGraphics locations, some of which offer LaserWriting, call (800) 528-4885, or (602) 882-4100 from within Arizona.*

**AlphaGraphics**
3079 Peachtree Road NE
Atlanta, GA 30305
(404) 233-9086

**Aptos Post Typography**
8058 Valencia Street
Aptos, CA 95003
(408) 688-7474

**Carbon Alternative**
2336 Market Street
San Francisco, CA 94114
(415) 431-6725
*LaserWriting service also available at the 2404 California store at (415) 567-5888.*

**CBM Type**
549A Weddell Drive
Sunnyvale, CA 94089
(408) 734-4300

**Desktop Publishing, Inc.**
1525 East Francisco Blvd., Suite 15
San Rafael, CA 94901
(415) 258-0767

**ImageSet Corporation**
555 19th Street
San Francisco, CA 94107
(415) 626-8366

**Interface**
2086 Sir Francis Drake Blvd.
Fairfax, CA 94930
(415) 459-6263

**Krishna Copy Center**
2111 University Avenue
Berkeley, CA 94704
(415) 540-5959

**Kinko's Copies—Capitol Hill**
611 Pennsylvania Avenue SE
Washington, DC 20003
(202) 547-0421
*Photocopy store. Note: Approximately 10% of the 300 Kinko's stores offer LaserWriting. To find one near you, call (800) 292-6640, or (800) 235-6919 from within California.*

**The Laser Edge**
360 17th Street, Suite 203
Oakland, CA 94612
(415) 835-1581

**Laser Printing Services**
26058 West 12 Mile Road
Southfield, MI 48034
(313) 356-1004
*Full-service store that focuses on publications*

**LaserWrite Corporation**
540 Bryant
Palo Alto, CA 94301
(415) 328-1988
*"The Modern Electronic Publishing & Technology Center"*

**Personal Computer Resources**
45 Pond Street
Norwell, MA 02061
(617) 871-5396
*Computer retail store*

**Spectrum Arts Ltd.**
1823 Eutaw Place
Baltimore, MD 21217
(301) 225-7372
*Graphic-artist background*

**TechArt**
3915-D 24th Street
San Francisco, CA 94114
(415) 550-1110
*Focuses on Mac graphics.*

**21st Century Graphics**
1122 SW Morrison Street
Portland, OR 97205
(503) 223-2212
*Graphic-arts background*


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CHASE

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*Stocks are traded through Rose & Company Investment Brokers, Inc., a Chase affiliate/Member NYSE and SIPC.

# Pipeline

## FASTCOMM MODEMS

Fastcomm Data Corporation has introduced a modem, the Fastcomm Modem 2496, that can transmit data at all popular speeds—300, 1200, 2400, and 9600 bps. Modems that operate exclusively at 9600 or 300/1200/2400 bps are available in the same series; users can upgrade these modems later with a Fastsnap board that provides them with additional speeds. Fastcomm modems feature auto-dial and auto-answer, nonvolatile memory that lets users customize and store operating defaults, and the Ensured Data Integrity (EDI) protocol for error-free transmission. The modems operate over both regular dial-up and two-wire leased phone lines. They are available in internal, external, and rack-mount versions; the external models have LED status indicators and speaker capability. *(List Price: Fastcomm Modem 2496, $999)*

Fastcomm Data Corporation
12347-E Sunrise Valley Drive
Reston, VA 22091
(703) 620-3900
CIRCLE READER SERVICE NO. **580**

**The Fastcomm Modem 2496 series can transmit data at 300, 1200, 2400, and 9600 bps and is available in internal, external, and rack-mount versions.**

## EPSON PRINTERS

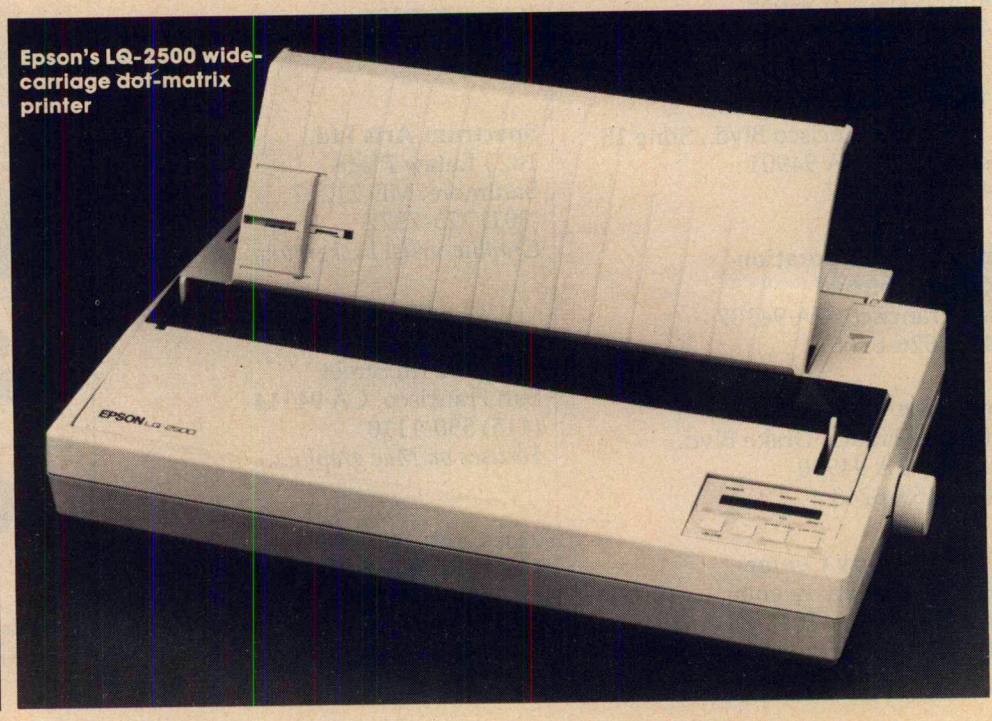
Epson America has released two new 136-column dot-matrix printers—the EX-1000 and the LQ-2500.

A companion to the 80-column EX-800, the nine-pin EX-1000 has a speed of 300 cps in draft mode and 60 cps in near-letter-quality (NLQ) mode at 12 cpi. In pica mode (10 cpi), it prints draft at 250 cps and NLQ at 50 cps. Like the EX-800, the EX-1000 has an eight-button SelecType II front control panel from which users can choose fonts and type-styles. Current selections are illuminated on the panel.

The 24-pin LQ-2500 prints at 324 cps in draft mode and at 108 cps in letter-quality (LQ) mode at 12 cpi. In pica mode, draft speed is 270 cps and LQ is 90 cps. It has a SelecType III LCD control panel that lets users enter and store up to 4 setup commands and control 14 printer functions, such as print quality, font, pitch, margins, and type of paper feed. To activate the SelecType III Panel, users respond to prompts on the LCD screen and push buttons on the panel.

Both printers also feature an 8K buffer, bidirectional printing, and built-in serial and parallel interfaces. Paper-feeding features include a bidirectional push-feed tractor and automatic sheet loading. Available as options are single- and double-bin cut-sheet feeders and a color option that produces text and graphics in seven colors. *(List Price: EX-1000, $995; LQ-2500, $1595)*

Epson America
2780 Lomita Blvd.
Torrance, CA 90505
(800) 421-5426
In CA (213) 539-9140
CIRCLE READER SERVICE NO. **581**

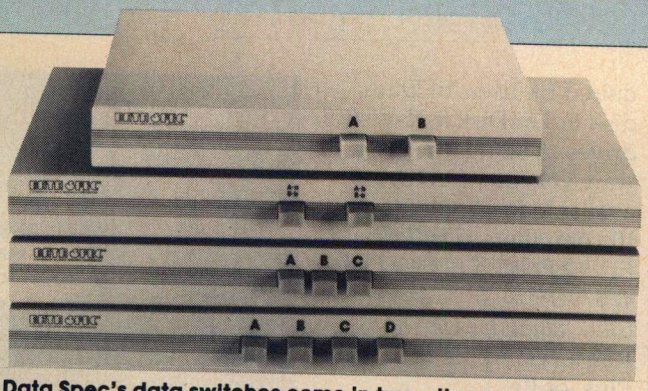



**Epson's LQ-2500 wide-carriage dot-matrix printer**

## DATA SWITCHES

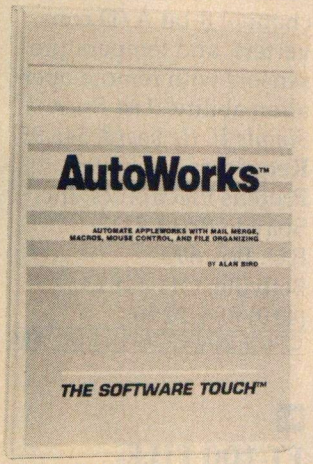
With Data Spec's new line of data switches, users can attach several peripherals to one computer or up to four computers to the same peripheral. The series offers various configurations, including 2-, 3-, or 4-way units with 9, 25, or 36 pins. The units have push buttons and antiskid feet, and are 1¼ inches high. They feature reinforced printed circuit boards, all-metal construction, gold-plated connector contacts, and duranium-plated switch contacts. *(List Price: ranges from $49.95 to $149.95)*

Data Spec



**Data Spec's data switches come in two-, three-, and four-way and crossover models.**

20120 Plummer Street
P.O. Box 4029
Chatsworth, CA 91313
Written inquiries only
CIRCLE READER SERVICE NO. **582**




**The AutoWorks enhancement program**

## FONTWORKS AND AUTOWORKS

FontWorks is an AppleWorks enhancement program for printing AppleWorks files in any of 17 fonts of various styles and sizes. You can use up to four typefaces at once for printing AppleWorks files. The included Font Editor lets you modify existing fonts or create new ones. The program uses the AppleWorks card-file interface and is compatible with most popular dot-matrix printers.

AutoWorks adds several time-saving features to AppleWorks, including mail merge, macros, new AppleWorks commands, mouse control, and file organizing. The macro feature lets you automatically enter up to thousands of keystrokes with one keystroke, and the file organizer helps you keep track of all your disk files by reading the file information directly from your ProDOS disks into an AppleWorks database file, where you can search for certain files and disks, sort on various file characteristics, and the like. AutoWorks is compatible with Applied Engineering's RAMWorks desktop expander and with Checkmate's MultiRAM memory expander. *(List Price: FontWorks, $49.95; AutoWorks, $39.95)*

**Requires:** FontWorks—Apple IIe or IIc, ProDOS, AppleWorks. AutoWorks—Apple IIe or IIc; 128K RAM; AppleWorks 1.1, 1.2, or 1.3

The Software Touch
9842 Hibert Street
Suite 192
San Diego, CA 92131
(619) 549-3091
CIRCLE READER SERVICE NO. **583**

## LEGEND C'CARD

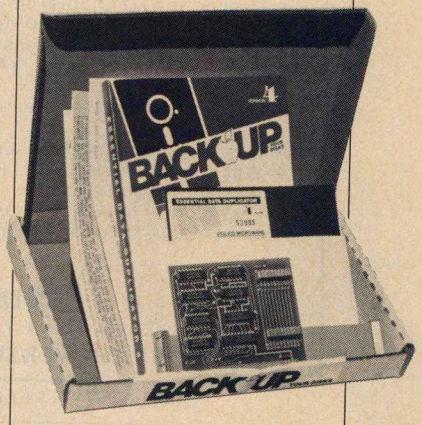
The Legend C'Card, an upgradable RAM card for the Apple IIc, is available in 256K, 512K, 768K, and 1-megabyte versions. The card can provide the computer with a total memory of up to 1152K, configured as either RAM- or electronic-disk emulation. Also included with the card are DOS 3.3 and ProDOS disk emulators and a wide range of utility programs. The card weighs less than 7 ounces and installs under the computer's keyboard. *(List Price: 256K, $219; 512K, $269; 768K, $319; 1 megabyte, $369)*

**Requires:** Apple IIc

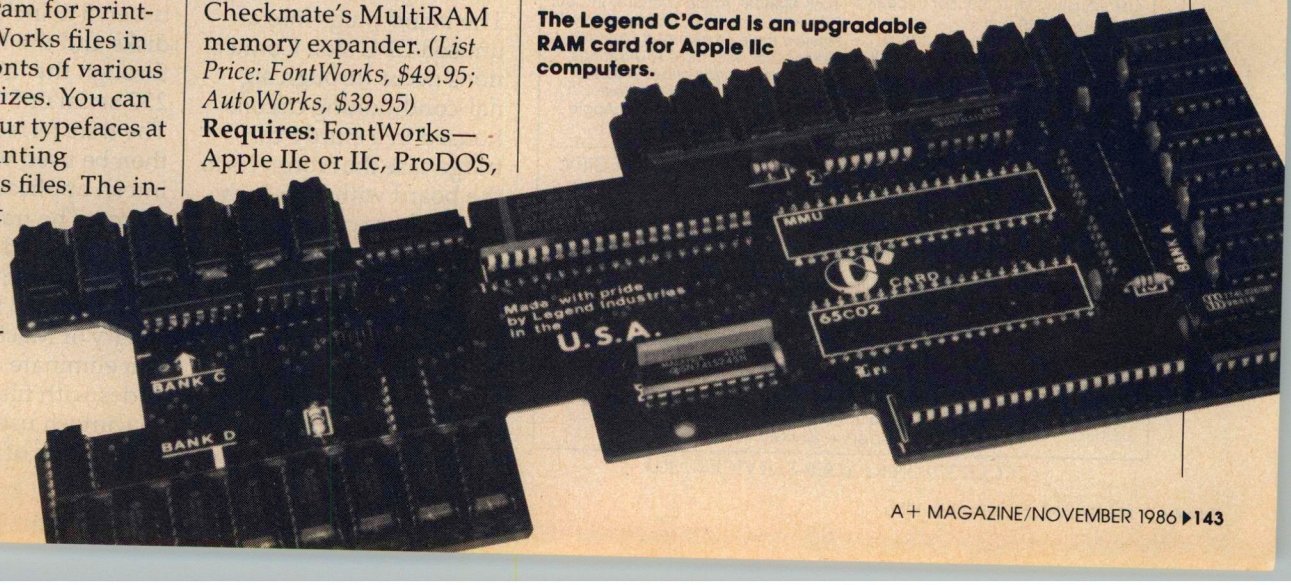
Legend Industries Ltd.
2220 Scott Lake Road
Pontiac, MI 48054
(800) 5-LEGEND
(313) 674-0953
CIRCLE READER SERVICE NO. **584**

## EDD 4 PLUS

EDD (Essential Data Duplicator) 4 PLUS is a hardware/software backup system for making archival copies of copy-protected disks. The system comes with a specially designed hardware card that plugs into an Apple II computer, allowing accurate copying of data bits from one disk to another. The system also has several useful software options that let users certify blank disks for data-storage ability, scan disks for locating important information, and examine disk-drive performance. A cable adapter is re-




**The EDD 4 Plus hardware/software backup system**




**The Legend C'Card is an upgradable RAM card for Apple IIc computers.**

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- Can also access files created by spreadsheets and data bases
- Barcharts, Scatterplots, clear comprehensive output
- Will run on APPLE II+, IIc and IIe with 80 column display, 1 disk drive

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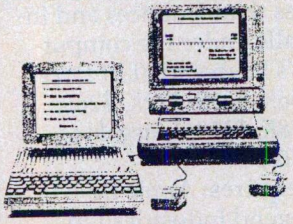
CIRCLE 207 ON READER SERVICE CARD

**You probably already know that Computers Need Maintenance!**

**But did you know that with *Intelligent Tools* your computer can maintain and diagnose itself?**



**MASTER DIAGNOSTICS™**

Master Diagnostics provides all of the tools and knowhow necessary so that *anyone* can do monthly maintenance duties. Calibrating disk drive speed, cleaning drive heads, checking track alignment or just adjusting your monitor to peak clarity is a snap.

In addition to the maintenance routines, extensive diagnostic procedures are available at the touch of a key. With our **new diagnostic construction set**; you can create peripheral diagnostics for any device card. Problems are diagnosed down to the chip level and tests will report: *what's right, what's wrong, what to do and how to do it.* Not just pass-fail type exams!

The user manual is easy to understand and is packed with money saving U-DO-IT information. The Drive Analyzer tests and calibration routines alone will pay for Master Diagnostics after using it just once.

**Expert Opinions**

Nibble magazine says, "This program should be in the library of every Apple user". Howard Sams Tech Manual, Apple Orchard, InCider Popular Computing, and the Apple II Review have all awarded Master Diagnostics with triple AAA ratings. *Consumers Guide chose Master Diagnostics as one of the best programs for 1985.* Used by Apple service centers world-wide.

WHEN ORDERING SPECIFY: version: II+, //e or //c

Master Diagnostics - $65.00 r 6.1

with Head Cleaning Kit - $75.00

Drive Analyzer alone - $39.95 (Included with MD)

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**Call Free 1-800-835-2246**

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**NiKROM** Technical Products, Inc.

176 Fort Pond Road ♦ Shirley, MA. 01464

*Upgrades - return diskette and $20.00*

CIRCLE 329 ON READER SERVICE CARD

# Pipeline

quired for users of Duodisk or UniDisk 5.25 disk drives. A standard software version of EDD 4 is available for Apple IIc or III computers. *(List Price: EDD 4 PLUS, $129.95; EDD 4, $79.95; cable adapter, $15)*

**Requires:** Apple II, II Plus, or IIe

Utilico Microware
3377 Solano Avenue
Suite 352
Napa, CA 94558
(707) 257-2420

CIRCLE READER SERVICE NO. **585**

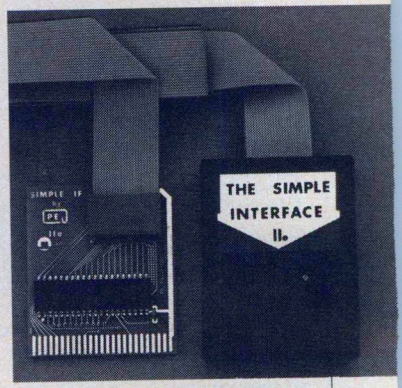
## HARDWARE

### SIMPLE IF IIe SYSTEM

The Simple Interface (IF) IIe System is a general-purpose I/O peripheral that lets Apple IIe computers connect to the real world. The system consists of the Simple IF IIe board and an assortment of special-function, plug-in conditioning boards.

The Simple IF IIe lets users connect up to eight switches and eight loads, such as lamps, relays, and small motors, to make their own security systems, energy controllers, light displays, and more. The board plugs into an unused CPU slot. Connections occur through signal-conditioning circuits housed in a sturdy cartridge case that connects to the board with a 36-inch cable. Users can program operations in BASIC or machine language.

The special-function conditioning boards include opto-isolated I/O conditioners, terminal strip boards, spst relay boards with up to 7-amp




**The Simple Interface (IF) IIe System, a general-purpose I/O peripheral**

control capability, multichannel 8-bit A/D converters, and temperature sensors with remote operation ability. *(List Price: Simple IF IIe board, $46.95)*

**Requires:** Apple IIe

Proteus Electronics, Inc.
Spayde Road RD2
P.O. Box 693
Bellville, OH 44813
(419) 886-2296

CIRCLE READER SERVICE NO. **586**

### FT-100 FILE-TRANSFER DEVICE

Dayna Communications has introduced the FT-100 file-transfer device, a new product in its line of interface systems for IBM and Macintosh computers. The FT-100 transfers data between 5¼-inch MS-DOS disks and the Macintosh through the latter's RS-232 serial or SCSI port. The transferred data can then be used within Macintosh application programs. The transfer process includes a choice of text, binary, or MacBinary formats. By selecting binary or MacBinary, users can eliminate control codes with filter utilities. Macintosh users need no knowledge of MS-DOS in

order to use the product. *(List Price: $595)*
**Requires:** Macintosh, 512K RAM
Dayna Communications, Inc.
50 South Main Street
Salt Lake City, UT 84144
(800) 531-0600
CIRCLE READER SERVICE NO. **587**

**The FT-100 device transfers data between 5¼-inch MS-DOS disks and the Mac.**

II SERIES

## JUICE POWER SUPPLY

Juice is a battery-based, uninterruptible power supply that protects Apple IIc computers from loss of data in memory because of power interruptions or surges. It also makes the IIc completely portable by providing up to two hours' operating time on a full charge of the Juice 12-volt battery. The unit weighs three pounds, comes ready to use, and installs easily. The top of the case contains an on/off switch and LEDs that indicate the battery's status. An accessory cord that plugs into an automobile cigarette lighter is also available. *(List Price: $169.95)*
**Requires:** Apple IIc
Orbic Controls
7853 Balboa Avenue
San Diego, CA 92111
(800) 433-4221
In WA and AK
(206) 488-8621
CIRCLE READER SERVICE NO. **588**

**The Juice uninterruptible power supply can operate the Apple IIc for two hours.**

II SERIES

## APE SHOOTER

Ape Shooter is designed to prevent hand fatigue from playing computer games by adding auto-repeat to game paddles. When you plug in the device between the game I/O port and your joystick's output cable, the paddles function normally when you press the fire button once, but if you hold the fire button for longer than half a second, the paddle repeats firing automatically at a rate of 30 times per second. The device works independently on either paddle, and you can adjust the delay time and firing rate. Ape Shooter comes in kit form only but is easy for users to assemble. *(List*


# KidsTime™ II

***for the Apple IIGS™***

**KidsTime™ II** is an educational package for young children that emphasizes creativity, exploration, and skill development. KidsTime II contains two educational programs, **ABKey™** and **KidsNotes™**, which were derived from the popular and successful Macintosh™ KidsTime programs. Your children ages 3 to 10 will enjoy using both programs and older children will also enjoy KidsNotes. KidsTime II is an excellent example of the high quality sound and graphics available on the Apple IIGS computer.

Great Wave Software™
*104 Gilbert Ave., Menlo Park, CA 94025, 415-325-2202*

### *ABKey*

ABKey teaches children to recognize letters of the alphabet and develop basic keyboard skills. The program includes many levels of challenge and difficulty. Pictures, letters, and synthesized sounds are used in this program. This program is made even more exciting with the use of high resolution color graphics and sound.

### *KidsNotes*

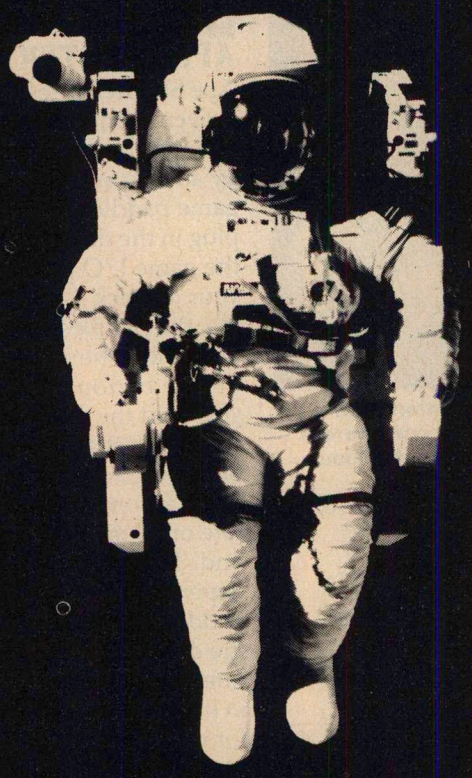
KidsNotes encourages children to have a positive and creative experience with music while learning the basics of musical notation. This introductory music program allows children to explore many aspects of music. Younger children can enjoy playing pre-recorded melodies. They also learn to associate the notes played with the on-screen piano keyboard and musical score. Older children will enjoy composing simple melodies and experimenting with rhythm, pitch, duration, tempo, volume, simple time signatures, and simple key signatures.

The complete KidsTime II package retails for only **$39.95**

(Apple IIGS and Color Monitor required.)

Great Wave, KidsTime, ABKey, and KidsNotes are trademarks of Great Wave Software. Apple IIGS is a trademark of Apple Computer, Inc. Macintosh is a trademark of Mcintosh Laboratory, Inc. and is used with express permission of its owner.

# TRY THIS ON FOR SIZE.



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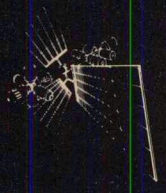

Our space station construction software, can get you to Space Camp for the time of your life. You'll need to get your hands on it and build us your best station.

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HesWare

P.O. Box 631-SCS
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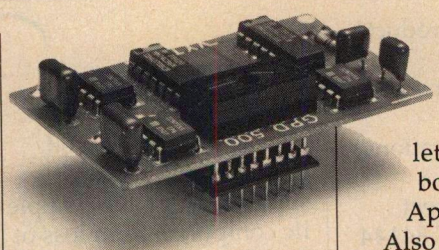
(415) 871-0570

CIRCLE 147 ON READER SERVICE CARD


# Pipeline



**Ape Shooter prevents hand fatigue by adding auto-repeat to game paddles.**

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Vytron
P.O. Box 7019
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IIe SERIES

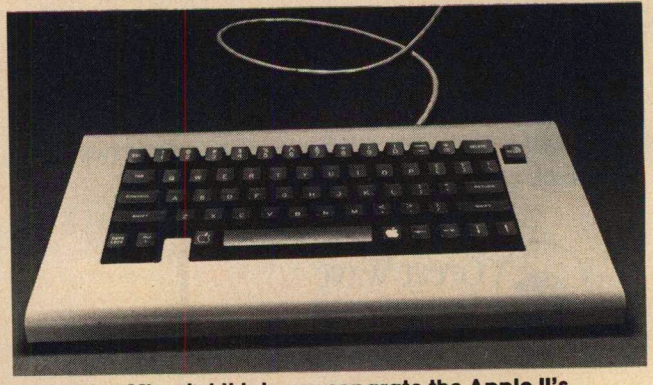
## D-TACH CONVERSION KIT AND KEYBOARD

Innovative Micro offers an enclosure kit that allows you to separate your Apple IIe's keyboard from the rest of the computer, for use under or beside your desk, in your lap, or for sharing between students in school. The D-Tach Conversion Kit—Model D100 is the same color as the Apple and has an eight-foot cord (you can order longer cords for $2 per foot). The unit comes with installation hardware, and installation take a Phillips screwdriver and about 15 minutes. A special keyboard kit lets you use two keyboards with a single Apple.

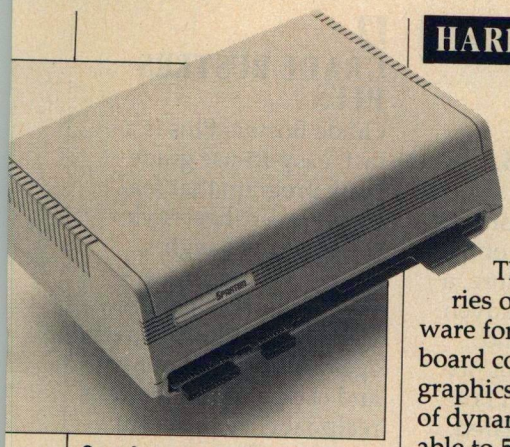
Also available is the D-Tach Complete Keyboard—Model D200, which features a numeric keypad. It also matches the Apple, has an eight-foot cord, and takes 15 minutes and a Phillips screwdriver to install. The ends of the unit are walnut, oak, or teak. *(List Price: Model D100, $99; Model D200, $249)*
**Requires:** Apple IIe
Innovative Micro, Inc.
34732 Calle Fortuna
Capistrano Beach, CA 92624
(800) 654-5529
CIRCLE READER SERVICE NO. **590**

## SPARTAN

Mimic Systems has reduced the price of Spartan, its Apple II Plus emulator. Spartan lets Commodore 64 computer run more than 95 percent of all available Apple II Plus software. In addition, the product lets users add a variety of Apple peripherals and options, such as 80-column display cards, music synthesizers, and



**Innovative Micro's kit lets you separate the Apple II's keyboard from the rest of the computer.**



**Spartan, an Apple II Plus emulator**

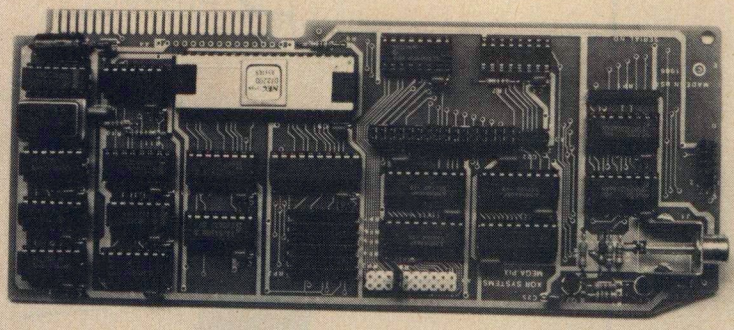
more. *(List Price: $299)*
**Requires:** Commodore 64
Mimic Systems
18027 Highway 99
Building A, Suite I
Lynnwood, WA 98037
(800) 663-8527
CIRCLE READER SERVICE NO. **591**

## HARD/SOFTWARE

### THE MEGA-PIX SERIES

XOR Systems has introduced The Mega-Pix Series of graphics hardware for Apple IIs. The board contains a 16-bit graphics processor; 128K of dynamic RAM, expandable to 512K; composite-video circuitry; a TTL connector; and an expansion bus for a color upgrade. The board provides a resolution of 640×200 pixels but is programmable to provide resolutions up to 1024×1024 pixels. Also included is a software package that features the Standard Graphic Interface (SGI), a subset of GKS; the Multi Graphic Interface (MGI), a superset of SGI; the Raw Graphic Package; and a turtle-graphics unit. A 3-D graphics package and source code are available.

*(List Price: $299 for monochrome version)*
**Requires:** Apple II Plus or IIe
XOR Systems
986 Live Oak Drive
Santa Clara, CA 95051
(408) 249-5388
CIRCLE READER SERVICE NO. **592**



**The Mega-Pix board for the Apple II series provides resolution of 640 × 200 pixels.**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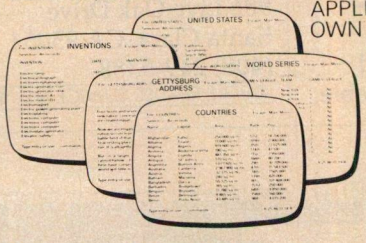


Requires AppleWorks, Apple IIe, IIc, or compatible.

See your software dealer or send $32.95 for each volume to:

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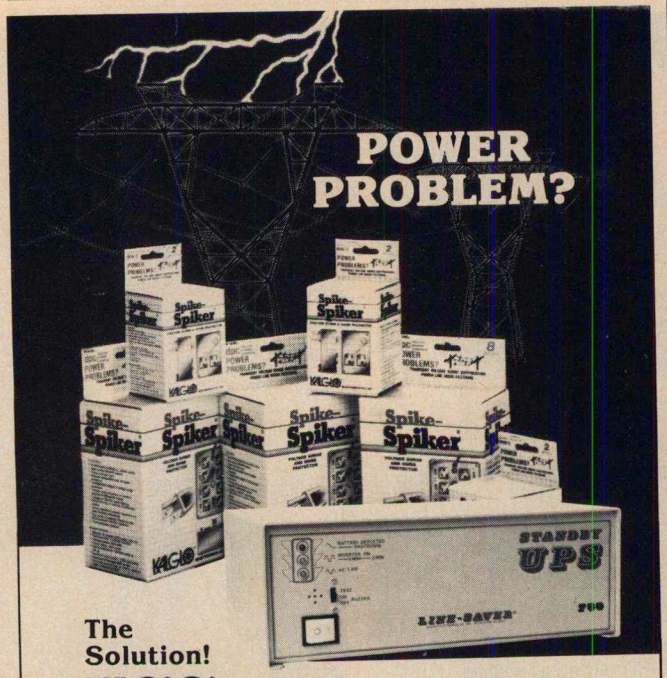
CIRCLE 138 ON READER SERVICE CARD

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CIRCLE 116 ON READER SERVICE CARD

# Pipeline

## SOFTWARE

### A CHRISTMAS ADVENTURE

BitCards has released an enhanced version of A Christmas Adventure, a text and graphics adventure game set in and around Santa Claus' ice castle at the North Pole. Santa has disappeared, and players must explore the rooms of the castle and outbuildings and find and free Santa in time for Christmas. The game features an easy-to-use customization utility that enables purchasers to insert personal references and a personal holiday-greeting message for the program's recipient. Also available is a free sampler/demo disk that contains more than half of the program and a mini customization utility. *(List Price: $24.95; demo disk, $1 for postage)*

**Requires:** Apple II Plus, IIe, or IIc; 64K RAM

BitCards, Inc.
P.O. Box 1289
Champlain, NY 12919
(514) 274-1103

CIRCLE READER SERVICE NO. **563**

### GRADE BUSTERS PLUS

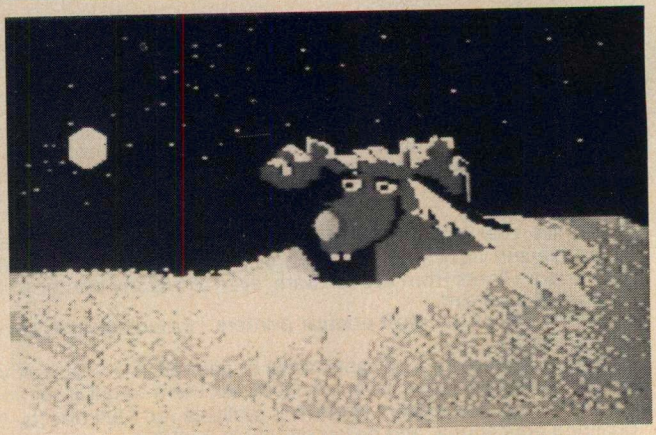
Grade Busters Plus is a fast, easy-to-use gradebook program that features spreadsheet-style correction of weights, grades, names, and assignments. It calculates weighted grades and averages for each assignment and class and lets teachers realphabetize rosters at any time. The program stores all data on copyable disks, each disk having room for 15 classes per side, and can handle up to 40 students and 40 grades. Users can print two-page histograms with statistics, by class or assignment; full-page student reports listing each assignment; and four-student-per-page summary reports. Other features let teachers place messages on student reports, set each grade to a percentage, enter assignment descriptions, and more. *(List Price: $79.95)*

**Requires:** Apple IIe or IIc

Grade Busters Plus
36-10 Queen Anne Way
Colorado Springs, CO 80907

Written inquiries only

CIRCLE READER SERVICE NO. **564**



**A Christmas Adventure from BitCards, Inc. is a text and graphics adventure game set in and around Santa's ice castle at the North Pole.**

SERIES

## PROTEUS—THE IDEA PROCESSOR

PROTEUS—The Idea Processor is a menu-driven program that teaches writers of all ages and abilities to generate and develop ideas and information. It offers five "prewriting" strategies, each with clear, readily available help screens. It also provides automatic storage of information, can retrieve data, and can print out information from any point in the program. The program comes with a clear, nontechnical manual, and ten-disk laboratory packs are available with the purchase of each program. *(List Price: $79.95; lab pack, $250)*

**Requires:** Apple IIe

Research Design Associates, Inc.
P.O. Box 848
Stony Brook, NY 11790
(516) 928-5700

CIRCLE READER SERVICE NO. **565**

SERIES

## PARTYWARE, HEARTWARE

Hi Tech Expressions has released two new products—PartyWare and HeartWare—in its line of computer-animated greeting cards, print-utility software, and supplies.

PartyWare is a card- and party-design kit with which users can print party hats, banners, ribbons, place mats, party-planning lists, and thank-you notes. Users can maintain a database of up to 60 names, addresses, phone numbers, birthdates, and two other events for each individual. They can print invitations, notes, and greeting cards using the software's selection of graphics, borders, and salutations. The product also lets users create animated notes on disks to send to friends.

HeartWare lets users create friendship and love notes and cards. It features an animated love story in a nature setting with an accompanying verse that users can personalize with a message. Again, users can copy the message to another disk to send to friends. They can also make full-page and quarter-page printouts from a selection of graphics, including butterflies, love fish, a sunrise, and a heart-shaped leaf.

**PartyWare and HeartWare party- and card-design kits**

Available for use with these programs is WareWithAll, a paper-supply kit containing colorfully designed paper, envelopes, stickers, markers, and disk labels. *(List Price: PartyWare, WareWithAll, $14.95 each; HeartWare, $9.95)*

**Requires:** Apple II Plus, IIe, or IIc; 64K RAM

Hi Tech Expressions, Inc.
2699 S. Bayshore Drive
Suite 1000A
Coconut Grove, FL 33133
(800) 848-9273
(305) 854-2318

CIRCLE READER SERVICE NO. **566**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♦♦♦ SOFTWARE ♦♦♦

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| Epson LX-90 w/pic! | $235 |
| NEC Pinwriter P2* | $425 |
| OKIMATE 20 w/Interface | $190 |
| OKIDATA 192P/193 | $330/455 |
| QUME LetterPro20/Sprint1400* | $430/899 |
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| Applecat 212 system/upgrade | $353/214 |
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CIRCLE 126 ON READER SERVICE CARD

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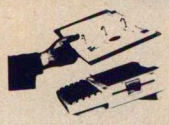

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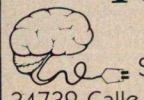


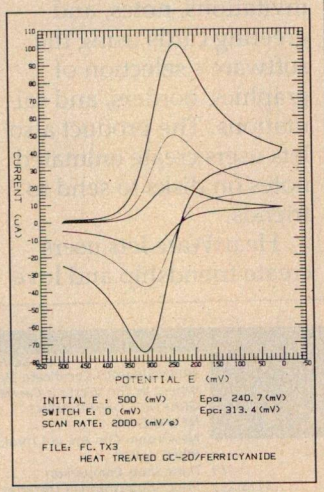
INNOVATIVE MICRO, INC.
Systems Wholesaler (714) 661-0435
34732 Calle Fortuna, Capistrano Beach, CA 92624


CIRCLE 153 ON READER SERVICE CARD

# Pipeline

## MICES

MiCES (Microcomputer-Controlled Electroanalysis System) electrochemistry data-acquisition and data-analysis software is now available from Interactive Microware. The software automates cyclic voltammetry, double-step chronocoulometry, differential pulse voltammetry, and measurements of cell resistance using the ADALAB data-acquisition and -control interface and the AI13 high-speed, analog-to-digital converter. The program allows multiple cyclic voltammetry scans with up to seven potential




**MICES displays data as an on-screen graph during collection.**

limits. Data is displayed as an on-screen graph during collection. Post-run reports include voltammetric peak current, peak area, and the slope and intercept for plots of Q vs. the square root of time. Complete electrochemistry workstations are also available. *(List Price: MiCES, $440; ADALAB interface, $545; AI13 interface, $600; workstation, $3579)*

**Requires:** Apple II Plus or IIe, 64K RAM, monitor, two disk drives, ADALAB interface, AI13 interface, plotter or printer, three-electrode potentiostat with integrator

Interactive Microware
P.O. Box 139
State College, PA 16804-0139
(814) 238-8294

CIRCLE READER SERVICE NO. **567**

## CAPTAIN

Developed for use with learning disabled or mentally retarded people, the Captain software system is designed to evaluate and train basic cognitive functions, including attention, concentration, memory, visual, motor, and reasoning skills. The system is easy to learn and use, letting users use a mouse, trackball, or Sip 'n' Puff visual-control system. The system comprises 21 programs in the following three modules: Attention Skills, Visual/Motor Skills, and Conceptual Skills. The programs all feature a game format, color graphics, sound feedback, an Assessment mode, a Training mode, and the ability to record and print scores. *(List Price: complete system, $595; modules, $249 each; master module, $49)*

**Requires:** Apple II Plus or IIe, 64K RAM, AppleMouse, Timemaster II clock/timer, one disk drive, color monitor.

Network Services
1915 Huguenot Road
Richmond, VA 23235
(800) 368-3472
In VA (800) 552-1828
(804) 379-2253

CIRCLE READER SERVICE NO. **568**

## RAPSHEET

Designed for the visually impaired, Rapsheet is a spreadsheet program that works with popular voice synthesizers and screen-reader programs. The spreadsheet can hold up to 132 labels, constants, and formulas in a matrix of 6 columns by 22 rows. Operations include addition, subtraction, multiplication, division, summation, and exponentiation. Users can edit, print, save on disk, and reload models they create. Special voice features let users review cell contents and individual rows and read columns vertically.

The program is available as "shareware." The distribution disk, which contains the software, a user's manual, and several example financial models, is available from BAUD, a users' group for talking-computer users. By sending a donation to Bill Grimm, the program's author, users can obtain the latest copy of the program, a print copy of the *User's Manual*, and a 90-minute audiocassette tutorial. *(List Price: free, but $5 for duplication and postage for BAUD, $35 donation for Grimm)*

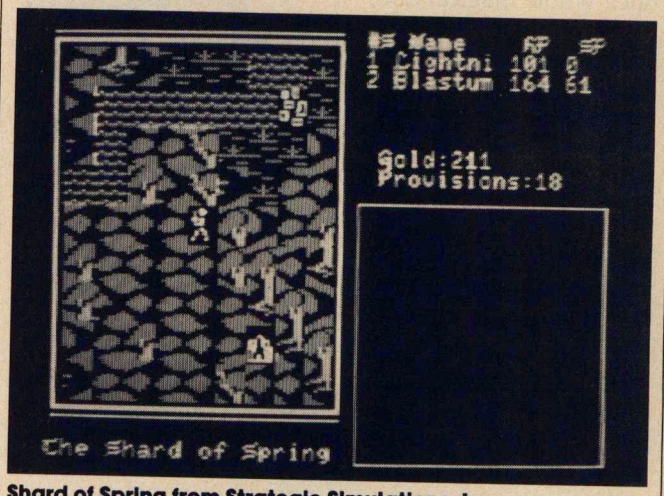
**Requires:** Apple IIe or IIc, 80 columns, synthesizer or screen-reader program

BAUD
1158 Steward Avenue
Bethpage, NY 11714
(516) 433-0171
or Bill Grimm
P.O. Box 10367
Fort Wayne, IN 46852
Written inquiries only.

CIRCLE READER SERVICE NO. **572**

## SHARD OF SPRING

The sixth game in Strategic Simulations' fantasy series, Shard of Spring is a multiplayer adventure




**Shard of Spring from Strategic Simulations, Inc.**


# Why do some mail order houses engage in negative advertising against RamWorks® and other Applied Engineering products?

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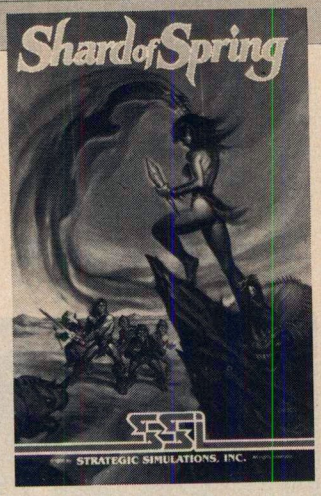
game in which players must rescue the shard from its captor, the evil enchantress Siriadne, and restore it to its home on the island of Ymros. The shard is the remnant of the once-whole magical Life-Stone. While it remained on Ymros, the island enjoyed eternal spring; without the shard, the inhabitants are in despair. Players form a party of up to five characters to search Ymros, fight monsters, and explore dungeons. They can cast spells using the five elements of nature. *(List Price: $39.95)*
**Requires:** Apple II, II Plus, IIe, IIc, or III
Strategic Simulations, Inc.
1046 North Rengstorff Avenue




Mountain View, CA 94043
(415) 964-1353
CIRCLE READER SERVICE NO. **573**

**SUNBURST SOFTWARE**

Sunburst Communications has released two new educational programs—Safari Search and The Smoking Decision. Safari Search, designed for grade levels 2 to adult, enhances students' math skills and develops problem-solving skills. The program takes players on a safari trip through a gridlike scenario in which they must decipher clues to find the hidden animals. The program consists of 12 series of games, such as Find the Flamingo, Search Out the Seal, and Locate the Llamas, at different skill levels.

Designed for grade levels 6 to 12, The Smoking Decision alerts students to the effects of smoking and provides them with an opportunity for decision making. The program presents students with facts regarding the dangers of smoking and then explores issues that concern many teenagers, such as peer acceptance. Throughout the program, students are confronted with a series of incremental decisions, leading to a final decision they must make as to whether or not to smoke. *(List Price: $59 each)*
**Requires:** Apple II Plus, IIe, or IIc; 48K RAM
Sunburst Communications, Inc.
39 Washington Avenue
Pleasantville, NY 10570
(800) 431-1934
(914) 769-5030
CIRCLE READER SERVICE NO. **574**

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**BACKUP YOUR SOFTWARE WITH LOCKSMITH 6.0™.**

Locksmith, the controversial copy program that took the Apple world by storm in 1981, has evolved from a powerful bit-copy programmed into a complete disk utility system, allowing the Apple user to recover crashed disks, restore accidentally deleted files, and perform hardware diagnostics on the disk drive and memory boards. The NEW Locksmith version 6.0 is now available and includes an advanced disk recovery utility, a framing-bit analyzer, an automatic boot tracer, a sector editor, many file utilities, and of course, the most powerful bit-copy program available. A fast disk backup utility copies disks in eight seconds flat. Improvements to Locksmith Programming Language have made it more powerful and easier to use for you to write your own backup and repair procedures. Includes a library disk which contains automatic procedures to copy hundreds of Apple programs.

Locksmith requires no additional hardware, but will use any additional RAM memory that it finds, including RAM boards from Applied Engineering and Checkmate Technology.

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4119 North Union Road
Woodstock, IL 60098
**(815) 568-5166**

VISA

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## MASTERING THE SAT

A new and improved edition of Mastering the SAT is now available for Apple II and Macintosh computers. The program includes two full-length practice exams and hundreds of Verbal and Math Skill Builder exercises. The program also has scoring and error-analysis features and an option to print out test analyses. An on-screen timer simulates the test-taking situation. The program comes with a 152-page *Student Workbook* containing two additional practice exams and information on test-taking strategies.

The program is available in versions for home and school use. The school edition's revised management system lets teachers track scores and progress of up to seven students simultaneously. The Apple II version of the school package includes four program disks, four backup disks, the *Student Workbook*, and *Teacher's Notes;* the retail package includes four program disks and the *Student Workbook*. Until December 31, 1986, owners of the first Apple II version can exchange it for the revised edition. The Macintosh version comes on one disk. *(List Price: Consumer Edition, $99.95; School Edition, $109.95; lab pack, $329.85; Apple II exchange: Consumer Edition, $20; School Edition, $30)*

**Requires:** Apple II Plus, IIe, IIc, or Macintosh with 512K RAM

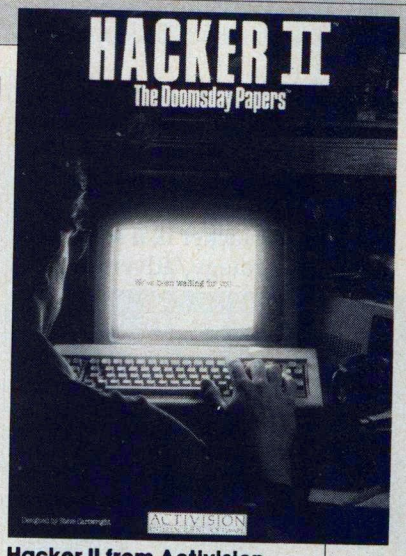
CBS Interactive Learning
One Fawcett Place
Greenwich, CT 06836
(203) 622-2500

CIRCLE READER SERVICE NO. **575**

## ACTIVISION GAMES

Two new games—Tass Times in Tonetown and Hacker II: The Doomsday Papers—are now available from Activision.

Tass Times in Tonetown is a fast-paced interactive-fiction game with animation. In the game, Gramps has disappeared into another dimension, and players must travel to Tonetown to find him. To gain acceptance from Tonetown's residents, players must change their outlook, helped by Chaz, the keeper of the 'Tique, who helps them keep up




**Hacker II from Activision**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- Only elementary programming is required to use the A/D.
- The entire system is on one standard size plug in card that fits neatly inside the Apple.
- System includes sample programs on disk.

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A few applications may include the monitoring of ● flow ● temperature ● humidity ● wind speed ● wind direction ● light intensity ● pressure ● RPM ● soil moisture and many more.

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- Single PC card
- 8 channels A/D
- 8 channels D/A
- Superfast conversion time
- Very easy programming
- Many analog ranges
- Manual contains sample applications

**A/D SPECIFICATIONS**

- 0.3% accuracy
- On-board memory
- Fast conversion (.078 MS per channel)
- A/D process totally transparent to Apple (looks like memory)
- User programmable input ranges are 0 to 10 volts, 0 to 5, −5 to +5, −2.5 to +2.5, −5 to 0, −10 to 0.

The A/D process takes place on a continuous, channel sequencing basis. Data is automatically transferred to its proper location in the on-board RAM. No A/D converter could be easier to use.

**D/A SPECIFICATIONS**

- 0.3% accuracy
- On-board memory
- On-board output buffer amps can drive 5 MA
- D/A process is totally transparent to the Apple (just poke the data)
- Fast conversion (.003 MS per channel)
- User programmable output ranges are 0 to 5 volts and 0 to 10 volts

The D/A section contains 8 digital to analog converters, with output buffer amplifiers and all interface logic on a single card. On-card latches are provided for each of the eight D/A converters. No D/A converter could be easier to use. The on-board amplifiers are laser-trimmed during manufacture, thereby eliminating any requirement for off-set nulling.

**PRICE $199**

### SIGNAL CONDITIONER

Our 8 channel signal conditioner is designed for use with both our A/D converters. This board incorporates 8 F.E.T. op-amps, which allow almost any gain or offset. For example, an input signal that varies from 2.00 to 2.15 volts or a signal that varies from 0 to 50 mV can easily be converted to 0-10V output for the A/D.

The signal conditioner's outputs are on a high quality 16 pin gold I.C. socket that matches the one on the A/D's so a simple ribbon cable connects the two. The signal conditioner can be powered by your Apple or from an external supply.

**FEATURES**

- 4.5" square for standard card cage and 4 mounting holes for standard mounting. The signal conditioner does not plug into the Apple, it can be located up to ½ mile away from the A/D.
- 22 pin .156 spacing edge card input connector (extra connectors are easily available i.e. Radio Shack).
- Large bread board area.
- Full detailed schematic included.

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### I/O 32

- Provides 4, 8-Bit programmable I/O Ports
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- All I/O lines are TTL (0-5 volt) compatible
- Your inputs can be anything from high speed logic to simple switches
- Programming is made very easy by powerful on-board firmware
- The I/O 32 is your best choice for any control application

The I/O manual includes many programs for inputs and outputs.

**Some applications include:**
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Please see our other full page ad in this magazine for information on Applied Engineering's Timemaster Clock Card and other products for the Apple.
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their level of tassitude. They must also avoid the villain Franklin Snarl and are helped by Emmio, the dog reporter.

In Hacker II, a sequel to the strategy/adventure simulation Hacker, the government asks players to help collect information about a plot known as The Doomsday Papers that intends to destroy the U.S. Apart from a top-secret-operations document that gives intelligence-gathering information, players have few clues and no rules to help them with their mission. *(List Price: Tass Times in Tonetown, $39.95 for Apple II, $44.95 for Macintosh; Hacker II, $39.95 for Apple II, $49.95 for Macintosh)*

**Requires:** Apple II Plus, IIe, IIc, or Macintosh
Activision, Inc.
2350 Bayshore Frontage Road
Mountain View, CA 94043
(415) 960-0410
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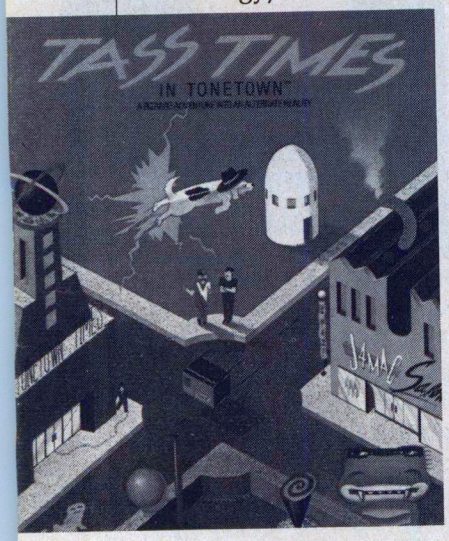


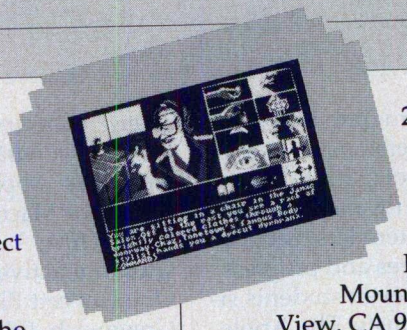

MAC

## MACPLOTS II/ DRAFTING VERSION 2.0

Computer Shoppe has released MacPlots II/Drafting Version 2.0, a software package that lets the Macintosh use plotters for high-resolution, color graphic output. Intended for architects, engineers, and draftsmen, the new version includes additional CAD features, such as Clipping for hidden-line removal, Line Specification for circuit-board design, Quick Plot, and Plot Position for placing multiple drawings on a single page. Other features include organization of files for maximum plotter efficiency, variable pen speeds, fill patterns that can be fixed or scaled, variable line thicknesses, and type sizes up to 72 points. *(List Price: $295)*

**Requires:** Macintosh, 512K RAM
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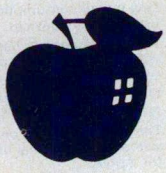

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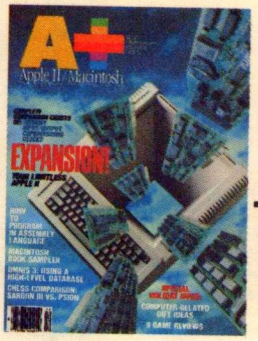


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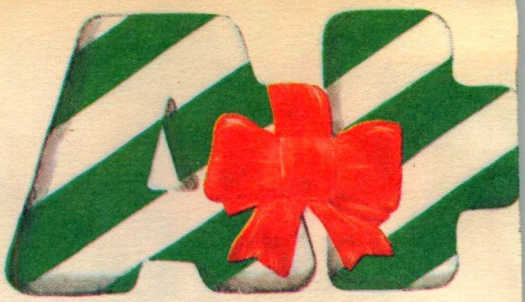

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## HRM SOFTWARE

Human Relations Media has introduced two new educational programs—Pizza Fractions and Voyages of Discovery.

For grades 4–7, the game Pizza Fractions uses colorful animation to help students learn about fractions graphically. Students enroll in the Pizza Institute, where they are taught to slice pizzas into sections and serve the number of portions requested by customers. The game has five levels of difficulty, which students must master to qualify for a job in a pizza parlor. The computer monitors their progress and "promotes" students when they are ready.

For grades 3–8, Voyages of Discovery simulates the Lewis and Clark expedition of 1804–06. Students are in charge of the expedition from its formation at St. Louis, where they buy supplies, ammunition, and gifts for trading with Indians. Their mission is to find a river route to the Pacific Ocean and discover as much as they can about the Western Territories. The program is designed to give practice in map-making and reading, note taking, and math and to stimulate problem-solving skills. *(List Price: Pizza Fractions, $59; Voyages of Discovery, $69)*

**Requires:** Apple II, II Plus, IIe, or IIc; 48K RAM; DOS 3.3
HRM Software
175 Tompkins Avenue
Pleasantville, NY 10570
(800) 431-2050
In NY (914) 769-6900
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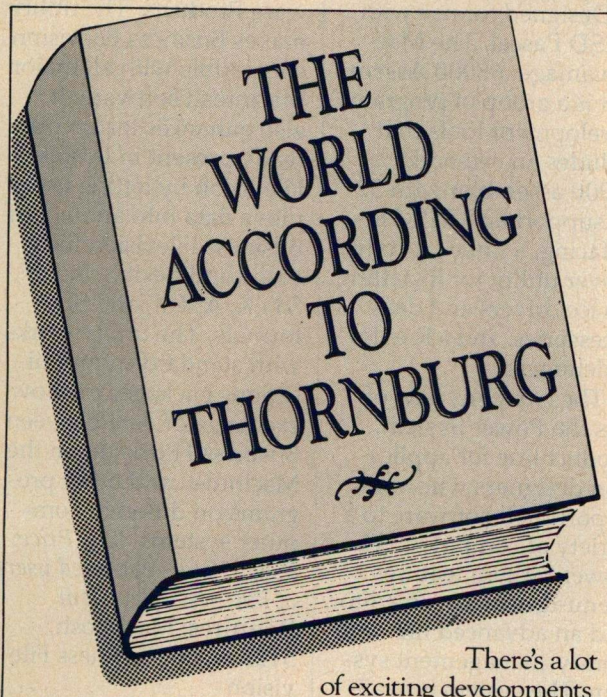
## DEVELOPER DISK #2

Developer Disk #2, the second product in Nite Owl Productions' Developer Disk series, contains program tools and program building blocks designed to help both novices and experienced programmers create programs for Apple II computers. The disk includes seven new programs, on-screen help files, demonstration programs, and exercise files. The seven programs are The Director, which adds a Directory command to ProDOS; Gofer, which enhances ProDOS to provide a structured approach to Applesoft programming; Stickit, which lets users add machine-language routines directly to Applesoft programs; Window; File Copy; PUP, a ProDOS utility program; and PDA, a ProDOS directory alphabetizer. *(List Price: $39.95)*
**Requires:** Apple II Plus, IIe, or IIc; 80-column card
Nite Owl Productions
5734 Lamar
Mission, KS 66202
(913) 362-9898
CIRCLE READER SERVICE NO. **579**

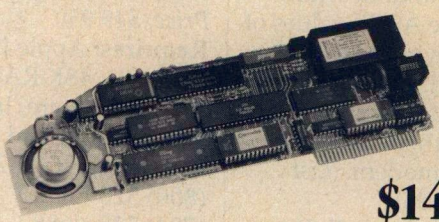




There's a lot of exciting developments in the field of education using Apple technology, and David D. Thornburg will keep you informed.

Every issue of A+ contains his ideas and comments on the trends and controversies in education.

Be sure to read the Learning Curve in A+, it's guaranteed to make you think!

## AppleMate 1200 Modem



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# Pipeline

## WORD SALAD

A cryptographic word processor for Apple II computers, Word Salad enables users to produce private E-mail and secret information. It can also function as a conventional word processor. The single program has an easy-to-use, full-screen text editor that can work with both encrypted and plain text files and menu-driven Disk, Printer, and Crypto systems. In addition to normal DOS 3.3 commands, the Disk system includes an Append Memory command and a Shred command, which destroys all data in selected files. The Printer system can output either plain or encrypted text. The Crypto system transforms plain text into cypher text by adding "random" numbers to the ASCII values of characters in the file to be encrypted. Users can store encrypted files on disk or transmit them by mail, voice, or modem. *(List Price: $29.95)*

**Requires:** Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive; monitor; parallel-interface printer

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The Golf's Best series of golf-course simulations now includes St. Andrews Old Course, the birthplace of golf and site of the British Open. The new simulation has two color-display modes—a standard mode and a double-high-resolution mode for Apple's new Color Monitor. The game reproduces wind conditions of the notoriously windy seaside golf course and the exact positions of bunkers, buildings, vegetation, hills, and valleys. *(List Price: $49.95)*

**Requires:** Apple II Plus, IIe, or IIc; 48K RAM

1 Step Software, Inc.
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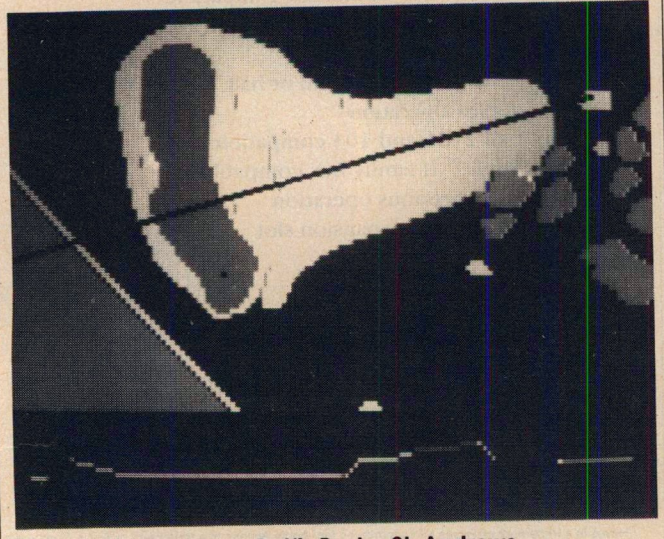

**A sample screen from Golf's Best—St. Andrews**

## PECAN SOFTWARE SYSTEMS

Pecan Software Systems has introduced two lines of program-development tools for Macintosh programmers.

In the MacAdvantage line, The MacAdvantage: UCSD Pascal package comprises an integrated UCSD Pascal compiler, symbolic debugger, and resource assembler. The compiler's features include 32-bit integers, bit manipulation, extended pointer intrinsics, and routines that generate in-line calls to ROM. The resource assembler lets users define icons, windows, and fonts within application programs.

Designed for use with UCSD Pascal, The MacAdvantage: 68000 Assembler is a group of program-development tools that includes an extended 68000 assembler with 32-bit support and ROM interfacing, a linker, a code-mover utility for installing device drivers and desk accessories, and a low-level debugger.

The company also offers the Power System product line for application designers who want to port their software to a variety of computers. The Power System features a menu-driven screen editor and an advanced file- and library-management system. The system is available with one UCSD Pascal compiler and with options to add FORTRAN-77 and BASIC compilers. Also available are other advanced-development tools, such as a 68000 assembler and linker, enhanced symbolic debugger, and other utilities. *(List Price: The MacAdvantage, Power System, $79.95 each; additional Power System compilers, $59.95 each; Power System advanced-development tools, $49.95 each)*

**Requires:** Macintosh

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## BUSINESS FILEVISION UTILITY

The Import/Export Data-Exchange Utility for Business Filevision is now available from Telos Software Products. The utility makes Business Filevision compatible with all major Macintosh software. It also enhances features already present in Business Filevision by letting users move data into and out of Business Filevision files easily and flexibly in DIF, SYLK, ASCII, and SDF formats. The utility works with standard communications packages to allow exchange of data between Business Filevision on the Macintosh and other programs on different computer systems. *(List Price: $50; $25 for registered users of Business Filevision)*

**Requires:** Macintosh, 512K RAM, Business Filevision

Telos Software Products
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Santa Monica, CA 90405-3395
(800) 554-2469
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CIRCLE READER SERVICE NO. **503**

BY STEVE ROSENTHAL

# THE IMPORTANCE OF THE PROCESSOR

## *Does the Apple IIGS's 65816 chip really matter?*

Doesn't it seem strange that Apple is touting the graphics and sound capability of its new Apple II computer rather than primarily emphasizing the upgraded processor chip? Only a few years back, whether a personal computer used an 8-, 16-, or 32-bit design seemed to be the most important question of all; now it apparently ranks only slightly above the number of keys on the keyboard.

This shift in approach didn't start with the IIGS. Ever since the current Apple management decided that the Macintosh and Apple II lines each had a place in a unified company, a change in emphasis has become evident. No longer does Apple present hardware advances as the defining character of its products; instead it plays up their "look and feel." Apple has become what Apple machines do, rather than what they're made of.

Part of that change, of course, is attributable to the growing importance of software and system solutions compared with the capabilities of the raw hardware itself. When hardware was very limited and most users wrote some or all of their own programs, getting maximum performance from each hardware component was essential. Now that most of us can afford much larger amounts of memory and better peripherals, the quality and power of the software we can purchase or write ourselves has, in most cases, become the most crucial performance factor.

The user interface has also become steadily more important. Although Apple has always put a lot of effort into making its software accessible and easy to use, the Macintosh formed a watershed in almost all of our thinking about user/machine interaction. Having a machine with that icon, mouse, and windows user interface is in itself more important than exactly how it comes about.

*Apple has become what Apple machines do, rather than what they're made of.*

A further moderating influence has been the growing realization that software compatibility is more important than a slight incremental gain in performance. Although some hardware buffs ooh and aah over every new advanced chip architecture, few of us who are primarily computer *users* would be willing to give up a large present and future selection of programs on an existing machine for a slightly faster execution speed on a machine with far fewer software choices. Furthermore, because buyers increasingly choose a machine on the basis of what software it runs and software authors choose which machines to program for on the basis of how many users will be looking for software for that machine, the feedback loop favors supporting existing successes instead of jumping to new hardware pathways.

In the case of the Apple IIGS, the primary potential purchasers of this machine—schools and home users who want school-related applications—haven't really exhausted the computing capability of their current machines. Most educational applications incorporate uncomplicated looping or branching structures with a limited amount of sorting and pattern recognition. Consequently, few of the programs are suffering from insufficient computational resources.

**ILLUSTRATION BY** MERCEDES McDONALD

Better sound and graphics could do a lot to improve the presentation of educational material, however.

Still, the GS *processor* is a generation more advanced than the 65C02 processor of the Apple IIe and IIc, which does make a difference. The main distinction, aside from faster clock speed on the newer chip, is that the 65C02 is an 8-bit processor, whereas the new 65816 includes both 8-bit operation and an added 16-bit mode. The most significant factor is not how large a data item each normally works with, but how large a chunk of memory it can directly keep track of.

The 65C02 of the Apple IIe and IIc, as well as the 6502 chip of the Apple II and Apple II Plus, can directly keep track of 64K (about 65,000 characters) of memory, which was a fair amount of storage at the time of their design. As do almost all popular 8-bit computer chips, the chips in the 6502 family use 16 bits of information for address pointers and address calculations (and 16 bits can point to $2^{16}$, or 64K, of locations).

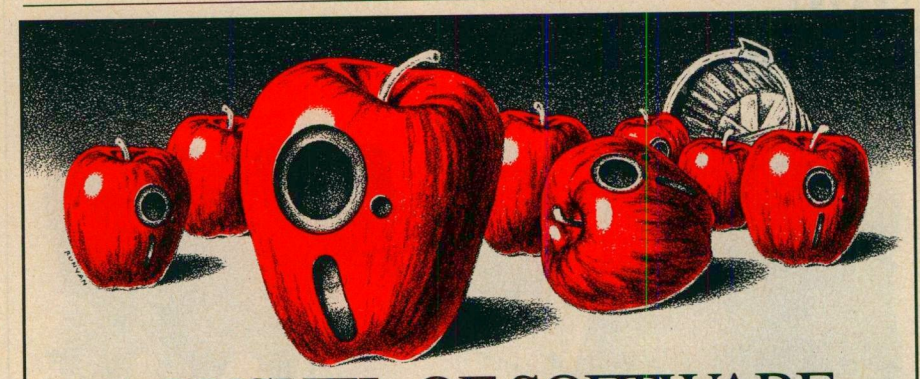
You can put much more memory than that into an Apple II-series machine; in fact, Apple designed the IIe and IIc to use 128K of memory by switching sections of memory in and out (bank-switching)—a trick to get around the processor's inability to address more than 64K locations at any given time. The 65816, by contrast, uses 24 bits for address computation and specification, resulting in a directly addressable memory space potentially 256 times as large as that of the 6502 (24 bits can point directly to $2^{24}$, or 16 megabytes).

More memory, in turn, can mean bigger programs or programs that keep more of our work in progress in fast electronic storage instead of on a slower-to-access diskette. The increased size of the programs, moreover, can provide greater subtlety or error checking rather than simply a capacity for larger jobs. In addition, a larger memory space allows the loading of more than one normal-size application into RAM at a time. This greater amount of coresidency encourages "pop-up" solutions such as auto-dialers, phone books, memo and note programs, and on-screen calculators.

More memory also simplifies the writing of system programs and applications. With less concern for absolute code efficiency, programmers can write more routines in high-level languages and include more error checking and exception handling.

From our perspective as users, we don't care if software developers do the job with one large linear memory or with banks, or which processor is in the machine, as long as the software does what we want it to (it could happen, for all we care, with mirrors and magnets). In fact, one of the reasons the Apple II and Mac lines have both been so successful is the degree to which they insulate us from the necessity of taking the inner workings of the computer into account.

For those of us who do write software, however, adding a 16-bit processor with a 24-bit address to the Apple II line may produce interesting new possibilities. And, still more important, Apple's willingness to design and promote a new member of the II series shows us that this market is still worth writing for. That, for both Apple and Apple-computer users, may be the biggest advantage of the new IIGS technology. ✚

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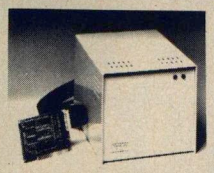

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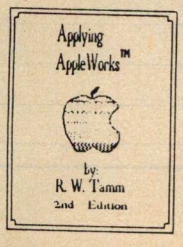


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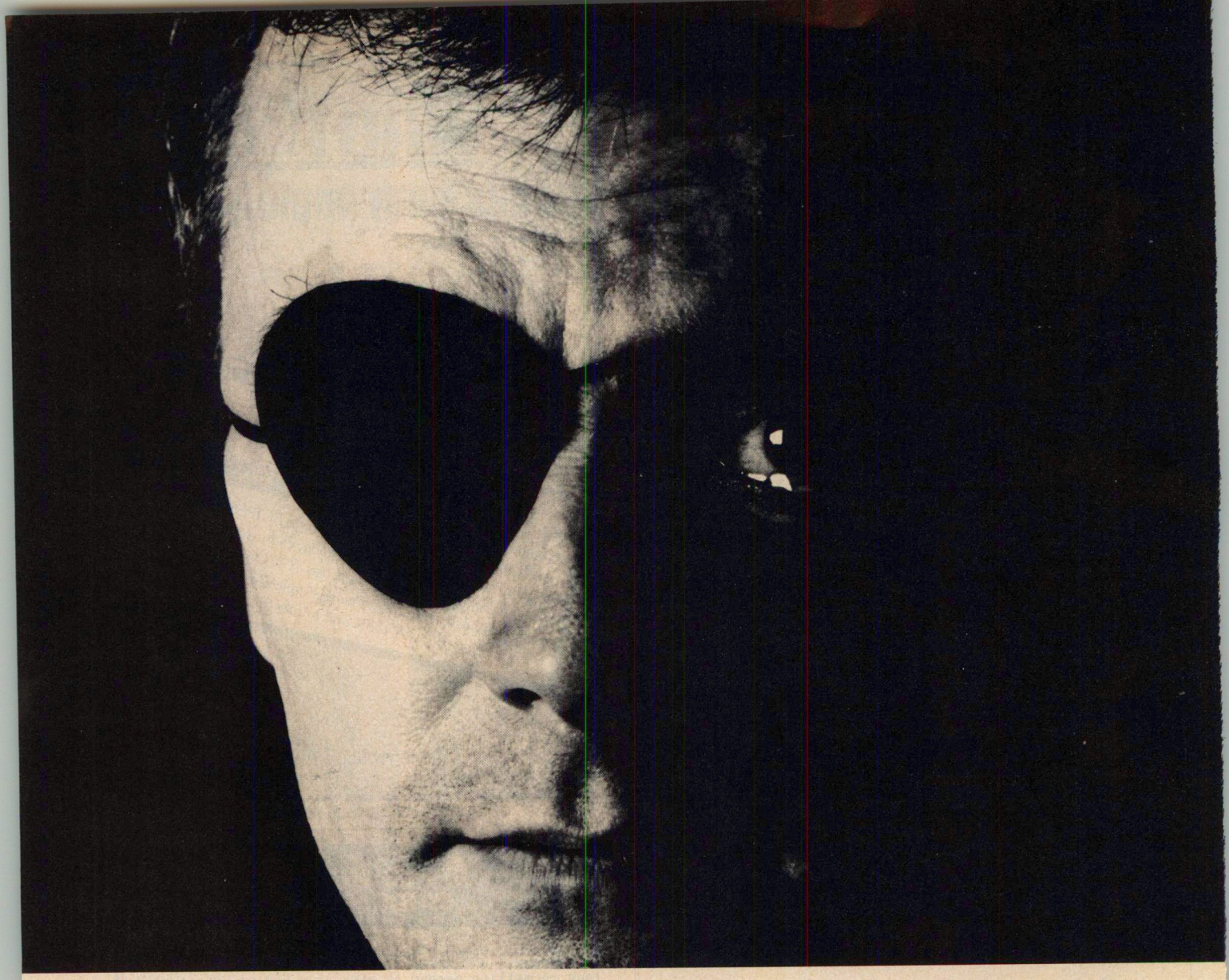

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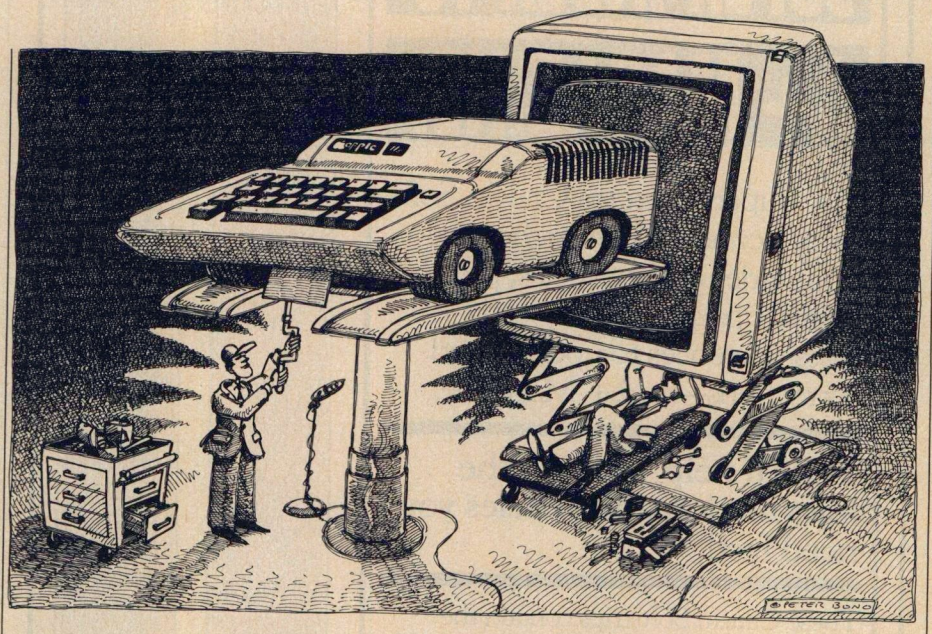
BY CRAIG CROSSMAN AND GARY B. LITTLE



## RESET AND SYSTEM TESTS

**Q.** *I know when you type Control/open-apple/Reset, it makes the IIe and IIc reboot. But what happens when I type Control/closed-apple/Reset? Is it some sort of test: Why doesn't my friend's IIc do this test? Also, sometimes when I type the former, my system goes into the test procedure anyway. Why?*

**A.** Control/closed-apple/Reset initiates a complete system check. It tests the full 128K of RAM and the ROMs on the IIe and IIc systems. All IIc systems with serial numbers less than D51000 had the old 16K ROM. Apple added a newer 32K ROM on the IIc to let it work with the UniDisk 3.5 and give it several other features. One of them was the closed-apple test routine. Most likely your friend has a IIc with the older ROMs, which does not do a self-test. The 32K ROM update is available at no charge from your local Apple dealer.

The open- and closed-apple keys are actually buttons 0 and 1 on your joystick/paddles, respectively. If button 1 is accidentally being pressed (maybe a book's lying on it or the joystick is defective), the computer will go into the Test mode when you type the open-apple sequence, since the closed-apple sequence overrides the open-apple sequence. —*CC*

## THE IIc AND RGB MONITORS

**Q.** *I wish to hook up an RGB monitor to my IIc. My dealer assured me that the port on the back that has the three circles on it is for this purpose. I tried to hook up my Sony RGB monitor and the Apple Color 100 monitor. The results were either a blank screen or a bunch of vertical white lines. Is it the cable?*

**A.** The cable is important, but that is not your main problem. Although Apple originally provided an RGB port, it never supplied the electronics to make it function. You need an additional box to make it work. Such an RGB adapter, which plugs into the back of the IIc, is available from Video-7, Inc. (12340 Saratoga Sunnyvale Road, Suite 1, Saratoga, CA 95070; [408] 943-0101). Then you need the correct cable to hook up your RGB monitor.

The Apple Color 100 comes with the correct cable. Most other brands of RGB monitors require a remapping of the colors since they are mostly set up for an IBM color signal. (One of the exceptions is Amdek's Model 500 RGB monitor, which has a switch on the back for setting it to the Apple or IBM color-mapping scheme.) Video-7 offers the Mappler, a small electronic device that accomplishes this remapping, and the company has even incorporated the Mappler into some of its newer RGB adapters. Some other monitor brands also require an additional interface in order to work. For example, the monitors in Sony's XBR series need a PC-701 adapter to make them work in the RGB mode.

In view of the variety of adapters, cables, and interfaces involved here, you should consult with a knowledgeable dealer who can coordinate all these factors and supply you with a working system. —*CC*

## GRAPHICS-SCREEN DUMPS WITH A CLOCK CARD

**Q.** *I understand there is a clock card for the IIc that you can use to perform graphics-screen dumps without running a disk-based printing utility. Do you know anything about it?*

**A.** I do now! (I must confess that the questioner enclosed a brochure of the product with his letter.) Strange as it may seem, the ProClock IIc from Practical Peripherals (31245 La Baya Drive, Westlake Village, CA 91362) performs screen dumps of both the high-resolution graphics screen (single-width only) and the text screen.

The ProClock IIc can dump the text screen (40 or 80 columns) to any printer. Graphics dumps (page 1 or 2) work with the most popular printers only: ImageWriter; Scribe; Apple DMP; Epson MX, FX, and RX; Okidata 82, 83, 84, 92, and 93; and a few others. There are commands to invert, rotate, emphasize, and magnify the graphics image; you can also print both graphics pages side by side.

The ProClock IIc is also a very good ProDOS-compatible clock, of course. —*GBL*

**ILLUSTRATION BY** PETER BONO

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Tip: To load text file into Appleworks, select: 1 3 2

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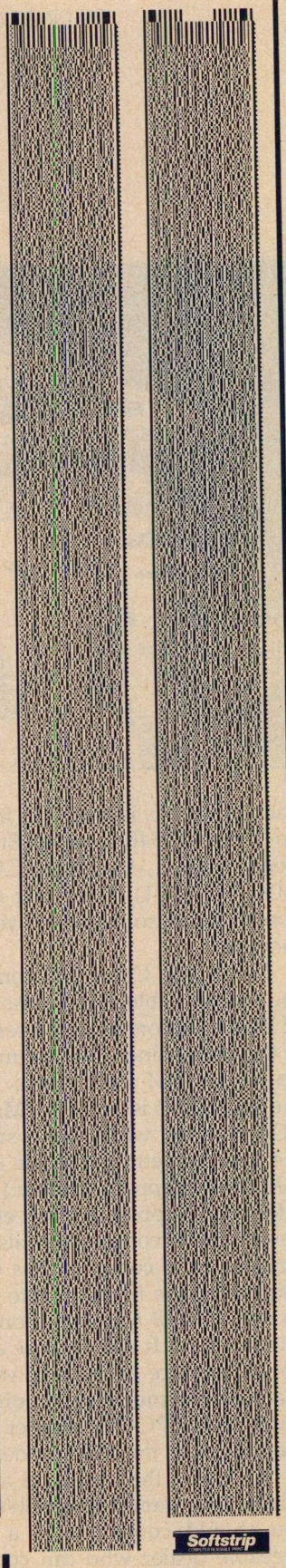



## COLOR PRINTING WITH NON-APPLE PRINTERS

**Q.** *I have just purchased a Quadram Quadjet ink-jet printer, and my friend has a Canon color ink-jet printer. We both have Dazzle Draw and Beagle Graphics but cannot print in color since the software provides no drivers for these printers. We bought the printers because we were impressed with their performance, but it seems as though we are doomed, since no one writes software to take advantage of their color-printing capabilities. Help!*

**A** This situation is a perfect example of the hazards of buying good hardware without considering the lack of software to complement it. The Scribe and the ImageWriter II are the only color printers most software vendors take into account, since they represent the Apple industry standard for color printers and are the most plentiful. I am aware of only one solution, and it turns out to be the best possible answer, not only for you but also for the owners of the aforementioned Apple printers.

FingerPrint Plus from Thirdware Computer Products (4747 N.W. 72nd Avenue, Miami, FL 33166; [305] 592-7522) is a Super Serial-compatible card for the IIe and IIc. It allows color printing on the Apple line of printers and yours as well. In fact, it also allows color printing (low-res, hi-res and double hi-res) on the Diablo, Okimate, IDS, Epson JX, Radio Shack, and the Citoh 1570 and 8510 color printers!

With this card's screen-dump facility, you can print *any* graphics software that displays the results on the screen, even if it was never intended by the software author to be printed (such as the high-score screen of a game). The card offers many other useful features in addition to color printing. —*CC* ✚

---

*Craig Crossman is vice president of operations for an authorized Apple dealer in West Palm Beach, Florida. He is a contributing editor for other Apple publications and the Apple expert for The Source and Viewtron.*

*Gary Little has written four books on how to program the Apple II and also wrote the Point-to-Point communications program.*

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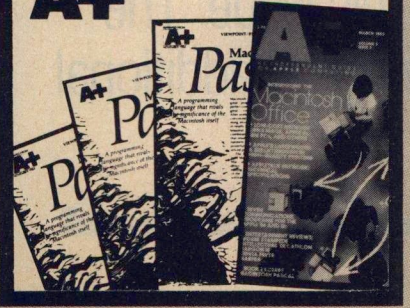

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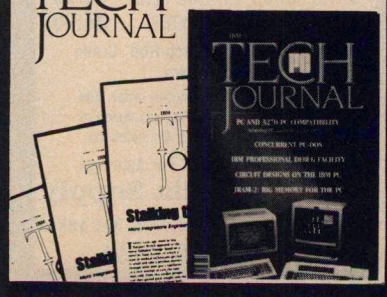


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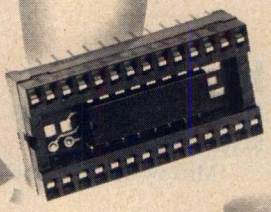

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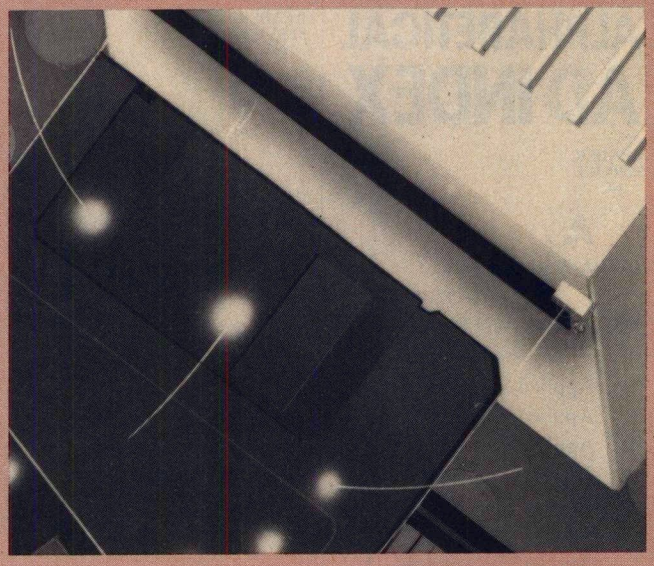

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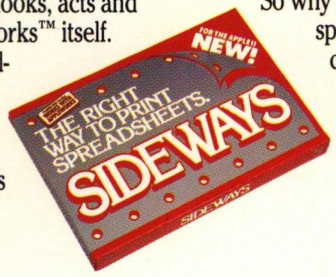


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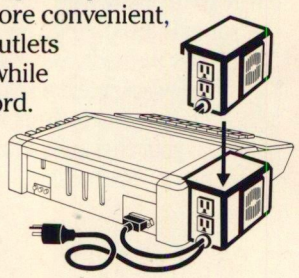

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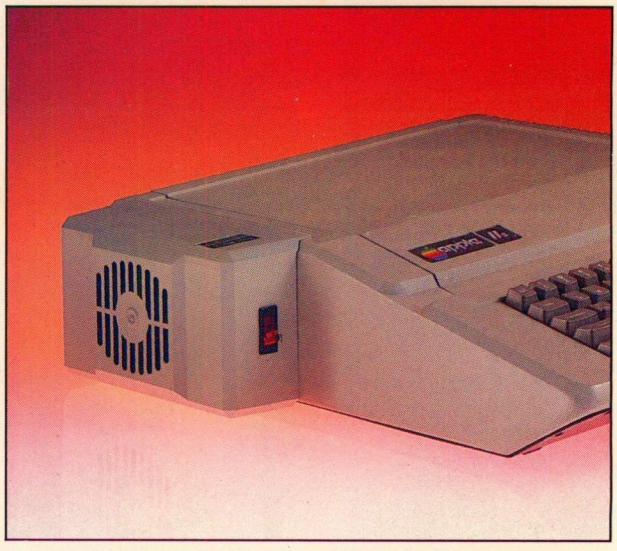

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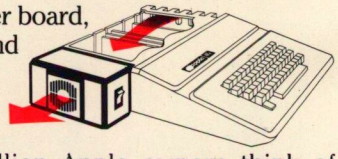

More than 1/4 million Apple owners think of System Saver as the piece Apple forgot. And 1/4 million well-protected Apples agree.

For a dealer near you, or to speak to a Kensington sales representative, call toll free (800) 535-4242 In NY (212) 475-5200.

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System Saver is UL Listed. System Saver's surge suppression circuitry conforms to IEEE specification 507 1980, Category A. Also available in 220/240 Volts, 50/60 Hz.

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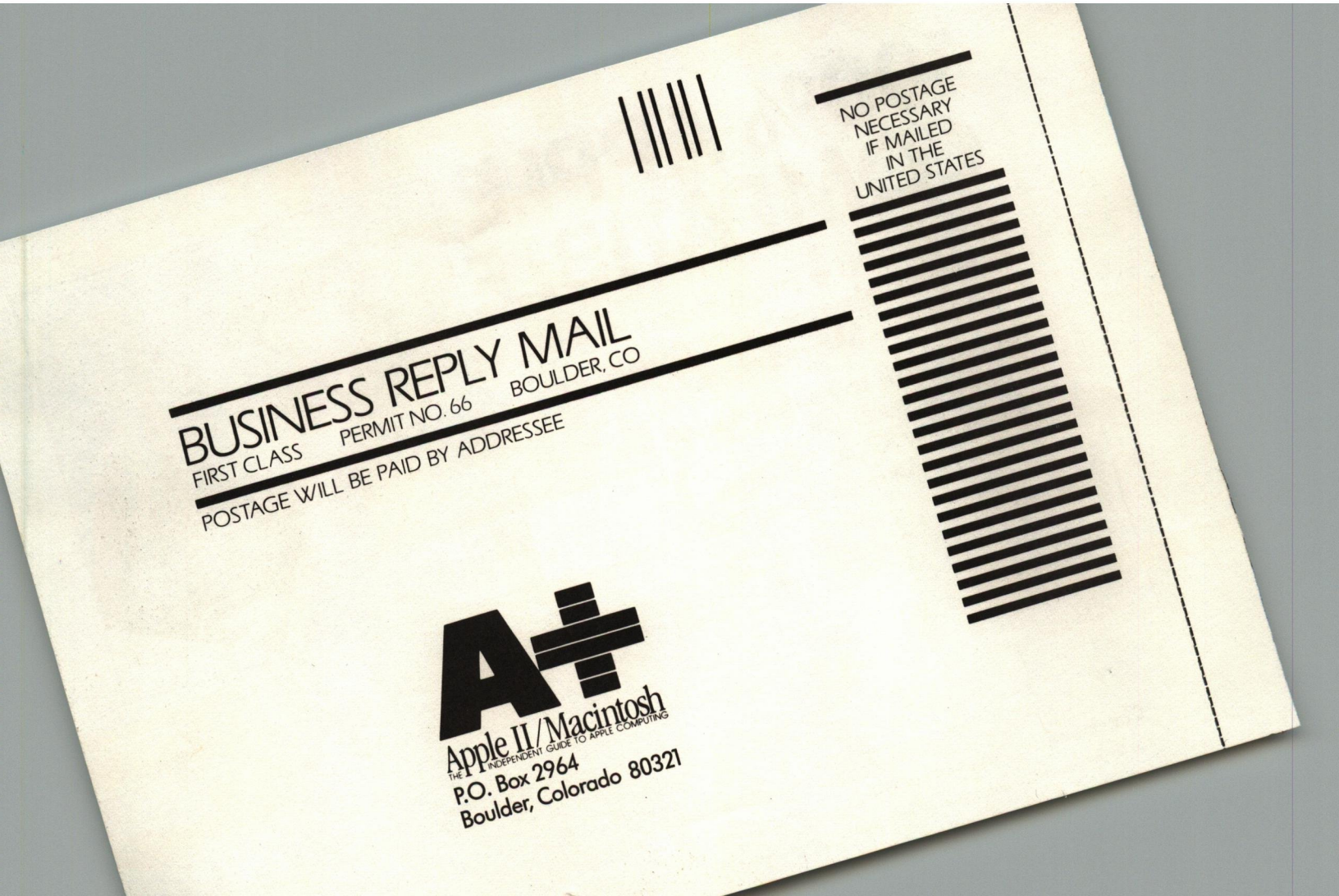
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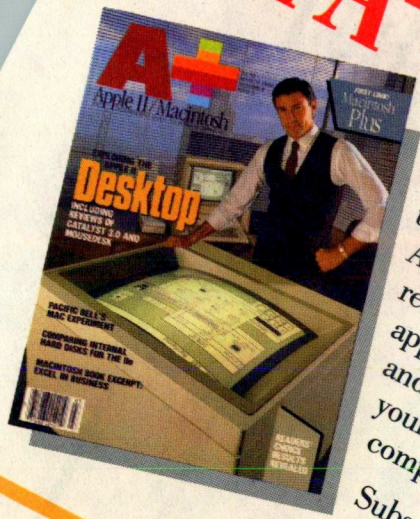


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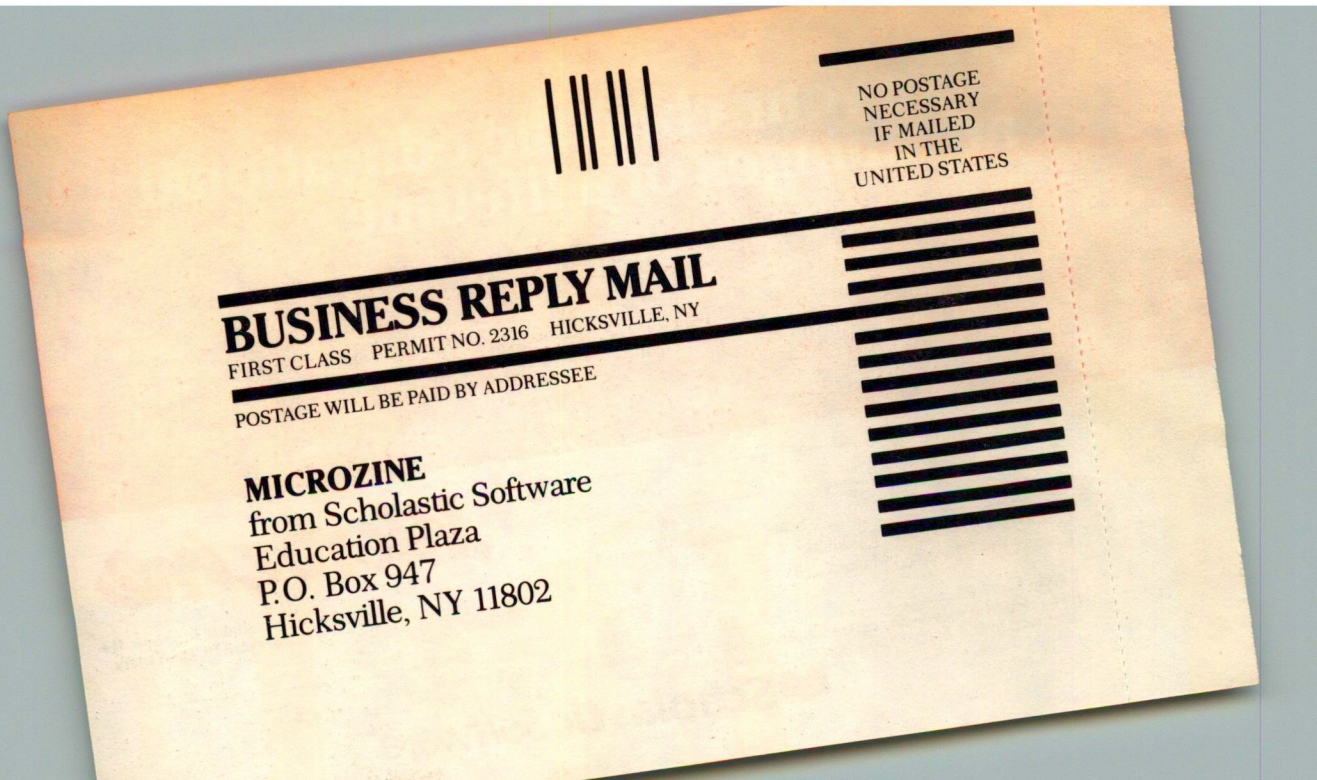

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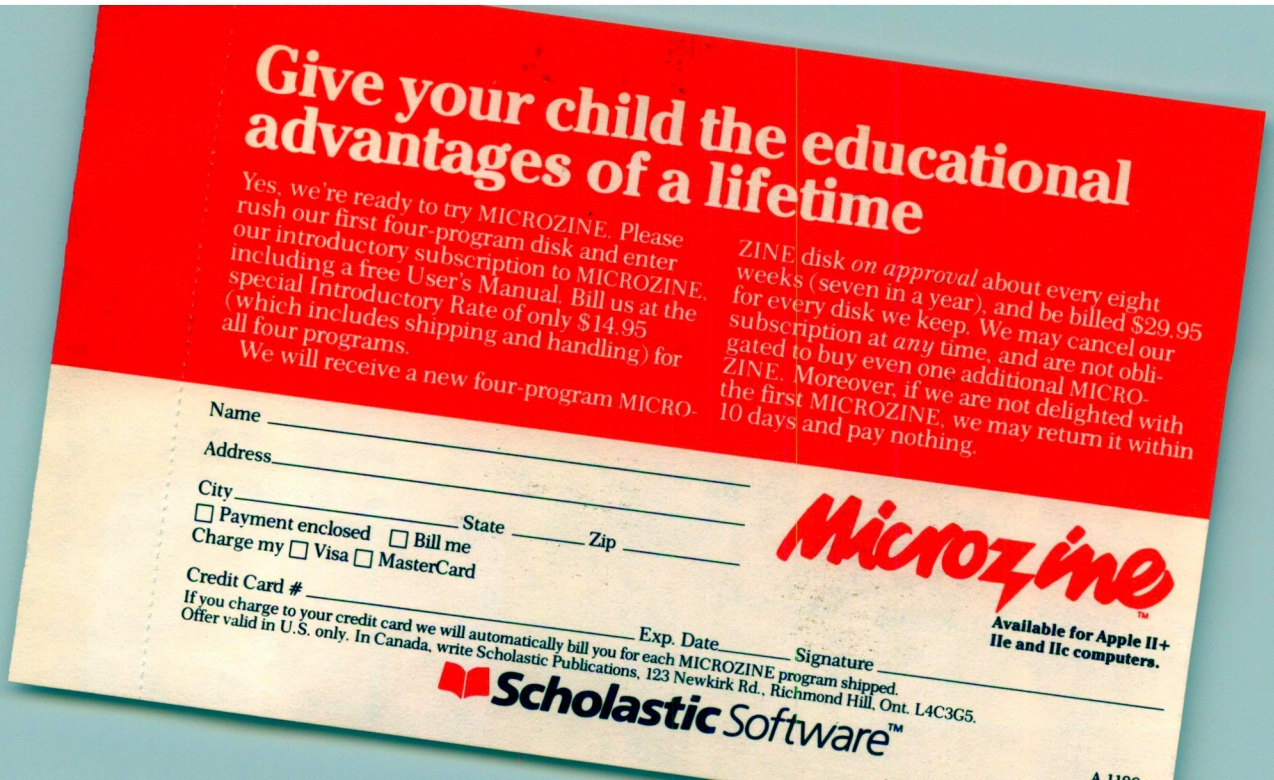
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